Driving Institutional Innovation for Agricultural Innovation Through R&D Projects: Learning From Two Experiences of Multi-Stakeholder Platforms Formation and Operation in Bolivia

Thesis

Driving institutional innovation for agricultural innovation through R&D projects:

Learning from two experiences of multi-stakeholder platforms formation and operation in Bolivia

Claudio Velasco Mac Lean

Thesis submitted for the degree of Doctor of Philosophy

Development, Policy and Practice

The Open University, UK

Date of Submission: 20 May 2013
Date of Award: 27 June 2013

May 2013

To Paula, Julian and Andrea, with love

Abstract

The idea that agricultural innovation does not only result from the transfer of research outputs to farmers but involves heterogeneous individuals and organizations interacting with each other and organizational and institutional conditions that constitute incentives or impediments for innovation to take place, is increasingly recognized as a promising idea among researchers and development practitioners engaged in research and development projects in developing countries. However the challenge of how to make these ideas accessible to practitioners and researchers with action-oriented purposes, whether for the design and implementation of R&D projects or for the in-depth investigation of innovation processes, has not yet been sufficiently addressed.

This is precisely the focus of this research. It seeks to begin filling this gap with theoretical, empirical and methodological contributions by studying in-depth two cases of R&D project-driven attempts to foster the establishment and operation of multi-stakeholder platforms within the Bolivian context of agricultural innovation. Combining conceptual developments offered by the innovation systems and collective action approaches, this research explores the formation and operation of two multi-stakeholder, R&D project-driven processes of collective institutional innovation.

Using action-oriented research methods, it was found that how, and with what effects, R&D projects act as drivers of institutional innovations processes is influenced by the tradition of designing and managing R&D projects, as well as by the prescriptive nature of projects defining what should be done, by whom, how, with what results, and for the benefit of whom.

There are implications for the design and management of R&D projects when they are used as institutional innovation drivers. The implications relate to the definition of objectives, outcomes and indicators of achievement; the definition of roles and positions of

the players; and to the instruments for projects planning, monitoring and evaluation. These research findings can help to shape agricultural innovation in Bolivia.

Acknowledgements

I would like to deeply thank to my supervisors Professor Hazel Johnson and Professor James Smith who have kindly and professionally guided me with invaluable advice, suggestions and comments to build this thesis. I extend my thanks to all the administrative staff, academics and students at the Development, Policy and Practice (DPP) at the Open University for their support and friendship during the last five years. I would like to acknowledge the funding provided by the Open University, the Innogen Centre and the International Potato Centre, which has allowed me to complete the PhD.

I would also like to thank Doctor André Devaux and all the professionals at the Latin America Science Potato Programme of the International Potato Centre, for helping me to combine my work responsibilities with my PhD research. Special thanks in this regard to my friend and colleague Paola Flores.

My family and I would like to extend a big thank to Hazel and Daniel, Farah and Alex who have warmly welcomed and accompanied us in the UK.

Thanks finally to all the members of the Bolivian Andean Platform, the Steering Committee of the Continuous Innovation Program in Cochabamba, the Native Potatoes Local Platforms and the Peach Local Platform, for their commitment, time and invaluable knowledge.

To Paula, Julian and Andrea, my parents and brothers; thank you for your unwavering love.

Contents

List of acronyms and abbreviations

AKIS	Agricultural Knowledge and Information Systems
ANDIBOL	Bolivian Andean Platform
BID	Inter-American Development Bank
CAPRi	Collective Action and Property Rights Initiative
CDC	Departmental Council of Competitiveness of Cochabamba
CD-PIC	Steering Committee of the Continuous Innovation Program in Cochabamba
CFTL ANDIBOL)	Company Specializing on Foreign Trade Logistic (member of
CGIAR	Consultative Group for International Agricultural Research
CIP	International Potato Centre
COSUDE	Swiss Agency for Development and Cooperation
FAO	Food and Agriculture Organization of the United Nations
FDTA	Foundations for the Development of Agricultural and Livestock Technology
GDP	Gross Domestic Product
IAD	Institutional Analysis and Development
IBTA	Bolivian Institute for Agriculture and Livestock Technology
IF	International Foundation (member of ANDIBOL)
IFAD	International Fund for Agricultural Development
INE	Bolivian National Statistics Institute
INIAF	National Institute for Innovation in Agriculture and Forestry
JICA	Japan International Cooperation Agency
NARS	National Agricultural Research Systems
NGO	Non Governmental Organization
PISA	Innovation Programme for Agricultural and Livestock Services
PITA	Innovation Project for Applied Technology
PMCA	Participatory Market Chain Approach
R&D	Research and Development
SIBTA	Bolivian Agricultural and Livestock Technology System
SNIAF	Bolivian National System of Agricultural, Livestock and Forestry Innovation

SMPFF	Small and Medium Private Firms Federation
SWOT	Strengths, Weaknesses, Opportunities and Threats

List of tables

List of figures

Chapter 1 Introduction

1.1 Introduction

Development practitioners and researchers engaged in Research and Development (R&D) projects, including myself, face the challenge of how to use theoretical approaches to learn from theory to improve our practice, and in turn contribute back to theory through our experience. As a practitioner with almost 20 years' experience working on agricultural development in Bolivia and as a scientist working for the International Potato Centre (CIP), I have been involved during the last 8 years in developing conceptual models of institutional innovation to foster pro- poor agricultural innovation in the Andean region and in applying them through R&D projects. Whether these models can be improved and promoted in Andean countries; and whether, to what extent and with what effects R&D projects can be used to put them into practice, are questions reflecting my interest and therefore the focus of this research. This interest and focus are in line with the current efforts led by the new Bolivian System of Agricultural, Livestock and Forestry Innovation aimed at the formation and operation of departmental and local networks for pro-poor agricultural innovation across the country. In the same vein, they correspond to the interests of CIP and other international research centres of the Consultative Group for International Agricultural Research (CGIAR) system engaged in enhancing agricultural research outcomes and impacts through networks of innovation.

The emphasis on institutional innovation processes finds its theoretical basis in key concepts offered by the literature on innovation systems and collective action approaches. They are used in this research to design and conduct an in-depth, action-oriented study of two cases of R&D project-driven attempts to foster the establishment and operation of multi-organizational forms of collaboration within the Bolivian context of agricultural innovation. This research in turn aims to contribute theoretically well-grounded, empirical insights to the Bolivian System of Agricultural, Livestock and Forestry Innovation.

1.2 Research problem

In Bolivia, as in many other developing countries, agricultural innovation has been taking place and still has a place in a complex context of diverse and changing agro-ecological, and social and economic conditions. Beside the diversity of the agro-ecological conditions (climate, soil type, pest and diseases incidence, water availability for irrigation), the Bolivian agricultural sector is highly diverse in social and economic terms. There are approximately 400,000 small agricultural productive units (INIAF, 2010) with different production strategies, including production for self consumption exclusively, sale of surplus after household consumption, and production of some crops exclusively oriented to markets. Additionally, there are about 40 officially recognized ethnic groups in Bolivia; 7000 communitarian social organizations grouping small households across the country, 760 of them legally established as Indigenous Peasant Economic Organizations (INIAF, 2010; CIOEC, 2010); and more than hundred Non Governmental Organizations (NGOs) supporting poor rural people in agriculture, market access, organization, social participation and gender, natural resources management, health and education (JICA, 2007).

This heterogeneous context translates (in the past and currently) into multiple and often micro-located innovation agendas (such as a particular group, living in particular agro-ecology and with particular social and economic characteristics), which have challenged the approaches and initiatives aimed at strengthening the Bolivian system of innovation (whether at national, sub-national, or even at local level). This context still challenges the new Bolivian System of Agricultural, Livestock and Forestry Innovation, which has been led by the National Institute for Innovation in Agriculture and Forestry since 2008. This new Bolivian system emphasizes the responsibility of the state in the provision of essential public goods and its leading role in articulating the wide range of public and private actors

involved in agricultural innovation, ensuring the effective integration and participation of poor farmers in innovation processes (INIAF 2010a; 2010b; World Bank, 2009).

The discussion above relates to the current international debate regarding the need for effective multi-organizational forms of collaboration to organize agricultural technology promotion and the process of innovation in developing countries. The debate has given rise to the development, experimentation, and evolution of a variety of multi-organizational forms of collaboration in a similar variety of contexts. Public–private partnerships, coalitions, multi-stakeholder platforms and research networks, among others, are examples that are common in the mode of operation of organizations concerned with international agricultural research and development. Most of these efforts have been, and currently are, fostered or driven by R&D projects. While the general performance of these initiatives has been researched, in-depth studies are needed to understand how these multi-organizational forms are constructed, negotiated and re-negotiated in practice, to inform policy makers, donors, R&D organizations, and other development agencies involved in the design, implementation and evaluation of such initiatives (Horton et al, 2009).

Since 2011, the Bolivian System of Agricultural, Livestock and Forestry Innovation has been receiving the technical and financial support of a World Bank project valued at 39 million dollars. This project has as one of its goals helping the National Institute for Innovation in Agriculture and Forestry in leading the formation and operation of departmental and local networks for pro-poor agricultural innovation across the country (World Bank, 2011). Because the conceptual and practical basis of this national project is still underdeveloped, there is room for improvement by learning from the experience of similar initiatives in operation in Bolivia since before the new system's enactment.

This is precisely the context in which this research is of relevance and will contribute with theoretical and empirical insights by studying in-depth two cases of R&D project-driven attempts to foster the establishment and operation of multi-organizational forms of

collaboration within the Bolivian context of agricultural innovation. Both cases are of relevance because they correspond to R&D project-driven experiences currently in progress, in which multiple players with multiple attributes are involved to develop mechanisms that enable them to act collectively in fostering innovation. These contributions are also of relevance for CIP and other research centres of the CGIAR system in their efforts of fostering and engage themselves in networks for innovation to enhance research outcomes and impacts.

The first case corresponds to the Papa Andina Model which proposes multi-stakeholder platforms to foster pro-poor market driven innovation. The second corresponds to the Continuous Innovation Model which proposes multi-stakeholder platforms to foster poor farmers' needs driven innovation. Both models are put into practice through R&D projects: the InnovAndes Project and the Continuous Innovation Programme respectively. In this sense, these projects are used as instruments to drive the institutional innovation process entailed in the formation and operation of multi-stakeholder platforms.

1.3 Research questions

Taking in to account the complexity of the challenges faced by the new Bolivian system of innovation, the possibility of contributing to the current R&D project-driven efforts aimed at strengthening the system, three research questions focused the investigation of the two cases:

- What are the factors influencing how, and with what effects, R&D projects act as drivers of institutional innovation conducive to pro-poor agricultural innovation?

- How do institutional innovation processes driven by R&D projects affect the facilitation of the interactions and relationships between the multiple actors involved?

– What are the theoretical and practical implications for the design of conceptual models and of R&D projects, when they are used to drive institutional innovation processes aimed at fostering pro-poor agricultural innovation?

These questions guided the process of data collection and analysis, and the theoretical discussion of findings, which in turn resulted from an interactive (non-linear), deductive - inductive and progressive process of knowledge construction.

1.4 Theoretical basis and conceptual framework

The theoretical foundations of this research were drawn from key conceptual developments offered by the literature on innovation systems and collective action. As expressed by Spielman (2005, p. 7), the innovation systems approach "opens the black box of innovation" in the sense that it is comprehensive, systemic and flexible enough to integrate the wide range of determinants involved in innovation processes. These determinants include the patterns of interaction and relationships among heterogeneous individuals and organizations in the interactive learning process entailed in innovation (Johnson et al, 2003; Hall et al. 2008; Clark et al, 2003; Clark, 2002); the sets of institutions (rules, norms, procedures and policies) which, by governing the behaviour of individuals and organizations, constitute constraints and/or incentives for innovation (Edquist, 2010; Lundvall, 2002; Nelson and Nelson, 2002; Hall et al, 2006; 2008; Oyelaran-Oyeyinka, 2005); and the process of capacity building for innovation through institutional innovation (Barnett, 2006, Hall et al. 2008; Edquist, 2010).

For its part, the literature on collective action emphasizes the factors that affect the formation of groups and groups' ability to act collectively to achieve common objectives. Collective action can be understood both as the process entailed in the formation of groups and as the result of the relations of trust and reciprocity, common rules, shared knowledge

and expectations, and patterns of interaction among the members of the group (Sultana and Thompson, 2004; Kruijssen et al, 2007). The extent to which collective action is likely to succeed depends on the characteristics of the groups, including heterogeneity, leadership, internal institutional arrangements and patterns of interaction and relationships; the presence and actions of external agents; and the institutional and policy setting in which the groups operate (Agrawal, 2001; Poteete and Ostrom, 2004; Ostrom, 2004; Meinzen-Dick et al, 2002; Rasmuseen and Meinzen – Dick, 1995).

Combining conceptual insights from both approaches into a conceptual framework to guide data collection, analysis and discussion of findings, this research explores the institutional innovation process of multi-stakeholder platforms formation and operation as a form of collective action. Because of the focus on institutions, heterogeneity and facilitation in the research questions, conceptual insights from the literature on institutions and institutional analysis, innovation brokers and boundary organizations were organized within the elements of the conceptual framework to discuss findings and provide answers to the research questions from a theoretical perspective. A detailed discussion of the conceptual framework is offered in Chapter 2.

1.5 Research approach, methods and process

This research focuses on the institutional innovation process experienced by the actors involved in the formation and operation of the multi-stakeholder platforms. As such it was designed to generate knowledge to answer the research questions and to be useful for the actors involved to learn from their experience and improve their practice. Consequently, action-oriented research methods were selected to accomplish this twofold purpose and the process of data collection and analysis proceeded as an interactive (non-linear), deductive – interactive and progressive process of knowledge construction.

Multiple sources of data and multiple instruments to collect it (methodological triangulation and data triangulation) were used (Thomas, 1998), and spaces for critical reflection and discussion with the participants were opened to compare participants' different views, to gather further data, reinforcing or contradicting other pieces of data, and to challenge systematically the conceptual ideas and questions of the research. Each step of the process was carefully documented as part of a communication and information exchange strategy with the participants.

1.6 My personal position

The design of this research was influenced by my personal position as a practitioner with almost 20 years experience working on agricultural development in Bolivia and as a scientist working for the International Potato Centre (CIP). As a CIP scientist, I was directly involved in the conceptual development of the Papa Andina Model of multi-stakeholder platforms and in the design of the InnovAndes Projects used to put the model into practice in the Bolivian context. Therefore I already had close relationships with the actors involved before starting the study. This background risked the objectivity of the research, and how I addressed this issue is explained in Chapter 3. In relation to the second case, although this research was the first time I had approached the actors directly and formally, they had previous knowledge about CIP's interests in the topic, felt encouraged to be participating in my doctoral research, but they also expressed concerns about the practical utility of the research beside my scientific and academic interest. How CIP's and my own interests influenced the design of this research is outlined in Chapter 3.

1.7 Thesis structure

This section outlines the chapters through which this thesis is organized.

Chapter 2 discusses the key conceptual insights of the innovation systems approach, highlighting procedural, holistic, relational, interactional and institutional perspectives on

innovation. It offers a brief review on how the innovation systems approach has been used to study innovation in developing countries' agriculture, and identifies gaps in the literature. Then the chapter moves on to discuss what, in the literature, is referred as to the critical definitions that researchers should have in mind in researching collective action: a) the unit of analysis; b) the variables affecting collective action; and c) the type of problems that people seek to solve collectively. The chapter then offers reflections on why this research considers collective action and innovation as nested concepts, and discusses gaps in the literature that link collective action and innovation.

Finally, Chapter 2 critically discusses key literature on the innovation systems approach and understandings of collective action, and explains how key elements of both were combined into a conceptual framework to guide the process of data collection, analysis and discussion of findings. The chapter also outlines how conceptual insights from the literature on institutions and institutional analysis, innovation brokers and boundary organizations were added to, and organized within, the conceptual framework to help explain the findings and provide answers to the research questions from a theoretical perspective.

The need for in-depth, action-oriented studies on institutional innovation processes at the level of particular forms of multi-organizational collaboration, the conceptual framework and questions of this research, and the characteristics of the two cases subject of enquiry, informed the methodological design of this research, which is discussed in Chapter 3. The chapter starts by presenting the influence of my personal position in the design of the research and then discusses the theoretical basis on which a multiple case study strategy was selected, the deductive-inductive logic and the action-oriented nature of the research. The chapter explains how this theoretical discussion was put into practice within the interactive process of data collection and analysis and how problems of validity and

reliability in conducting action-oriented research, and particularly those associated with my personal position, were addressed.

Chapter 4 frames the context for which this research is of relevance and the scope of its contributions. The chapter offers an overview of the need for agricultural innovation in Bolivia, the complex innovation context and its challenges, and of the different approaches tried during the last three decades to organize an agricultural research and technology transfer system that meets the more pressing problems affecting agricultural production and the wide range of actors involved. Then the chapter outlines the two cases of R&D project driven processes of formation and operation of multi-stakeholder platforms aimed at fostering pro-poor agricultural innovation, which are the subject of enquiry, and discusses why the cases are of relevance. As noted above, these cases are: the Papa Andina Model, which proposes multi-stakeholder platforms to foster pro-poor market driven innovation, and the Continuous Innovation Model, which proposes multi-stakeholder platforms to foster poor farmers' needs driven innovation. Both models were put into practice through R&D projects: the InnovAndes Project and the Continuous Innovation Programme respectively.

Chapters 5 and 6 present and discuss in a sequential manner the evidence gathered through the process of data collection and analysis discussed in Chapter 3: Chapter 5 for the Papa Andina Model and the InnovAndes Project, and Chapter 6 for the Continuous Innovation Model and the Continuous Innovation Programme. These chapters present and discuss in a sequential manner the evidence gathered through the process of data collection and analysis discussed in Chapter 3 and focus on three aspects:

i. how over time the different participants in the multi-stakeholder platforms built their own understanding and expectations about the platforms;

ii. how different understandings and expectations corresponded to, were affected by, or shaped in practice the critical conceptual components of the models and the definitions contained in the R&D projects design; and finally,

iii. how the operation of the platform was differently perceived by the participants in line with or in contradiction to their understandings and expectations.

Finally each chapter draws conclusions about the findings for each case.

Chapter 7 uses the conceptual framework discussed in Chapter 2 to deepen the analysis of the findings in Chapters 5 and 6, focussing the discussion on: i) the contents of the R&D project and its respective conceptual model; ii) the facilitation of the interactions and relationships between participants; and iii) the attributes of the participants. The chapter goes on to discuss the effects of these factors on the results of the process of institutional innovation entailed in the formation and operation of the platforms, and develops conclusions to the first two questions that this research seeks to answer:

> What are the factors influencing how, and with what effects, R&D projects act as drivers of institutional innovation conducive to pro-poor agricultural innovation?
>
> How do institutional innovation processes driven by R&D projects affect the facilitation of the interactions and relationships between the multiple actors involved?

Finally, Chapter 8 discusses the contributions that this research makes regarding: i) the practical use of the innovation systems and collective action approaches in researching R&D projects-driven processes of collective institutional innovation; ii) the methodology for conducting in-depth, action-research case studies of these processes; and iii) the design

of conceptual models of collective institutional innovation and R&D projects. This last point addresses the third research question:

> What are the theoretical and practical implications for the design of conceptual models and of R&D projects, when they are used to drive institutional innovation processes aimed at fostering pro-poor agricultural innovation?

At the end of Chapter 8, ideas for further research and concluding remarks regarding the relevance of this research for the current efforts of strengthening the Bolivian system of agricultural innovation are proposed.

Chapter 2 Institutional innovation and collective action: the conceptual framework of this research

2.1 Introduction

As discussed in the introduction, this research seeks to contribute to the new Bolivian System of Agricultural, Livestock and Forestry Innovation in its R&D project-driven efforts of formation and operation of formation of departmental and local networks for pro-poor agricultural innovation across the country. The theoretical foundations of this research drew on key conceptual developments offered by the literature on innovation systems and collective action approaches. Combining conceptual insights from both approaches into a conceptual framework, this research explores the institutional innovation process of formation and operation of the multi-stakeholder platforms subject of enquiry as a collective action process. The discussion in this chapter is organized as follows:

Section 2.2 discusses the key conceptual insights of the innovation systems approach highlighting its procedural, holistic, relational, interactional and institutional perspectives on innovation. The section also offers a brief review of how the innovation systems approach has been used to study innovation in developing countries agriculture, and identifies and reflects on gaps in the literature.

Section 2.3 moves on to discuss the critical definitions that researchers should have in mind in researching collective action: a) the unit of analysis (collective action by whom?); b) the variables affecting collective action (what affects collective action?); and c) the type of problems that people seek to solve collectively (collective action for what?). Section 2.3 offers reflections on why this research considers nested collective action and innovation concepts; and finally, it discusses gaps in the literature that links collective action and innovation.

Key elements in the innovation systems and collective action approaches are combined in Section 2.4 to build the conceptual framework of this research. The procedural, holistic, interactive and institutional perspective on innovation is used to build a working definition of institutional innovation relevant to the research questions. Insights into the collective action literature are used to define the unit of analysis, the nature and forms of the collective action process under consideration, the factors affecting the process, and its expected results. Insights from the literature on institutions and institutional analysis, innovation brokers and boundary organizations are used to complete the conceptual framework, used in Chapter 7 to analyse and discuss the findings presented in Chapters 5 and 6, and to give answers to the research questions from a theoretical perspective.

Finally, Section 2.5 concludes this chapter highlighting how this research differs from other studies reported in the literature.

2.2 Innovation and innovation systems approach

The idea about the innovation systems approach was first discussed in developed countries in the middle of the 1980s. The concept emerged from the work of policy makers and researchers of innovation aimed at explaining developed countries' different patterns of industrial growth (Lundvall et al, 2002). One explanation was differences in the research systems and patterns of innovation between countries. Researchers and policy makers involved in the debate found that most of the knowledge needed for innovation in industrial production did not come only from scientific and technical research, and experimental development, but also from the knowledge stock within firms, from other economic agents such as, retailers, wholesalers and customers, as well as from the interaction between these agents and their economic activities (Johnson et al, 2003). The necessity to integrate these broader contributions into a concept of innovation process gave rise to the concept of the innovation systems (Lundvall et al, 2002; Johnson et al, 2003;

Edquist, 2001; Bell & Albu, 1999). Since then, the concept has evolved and has been applied by a narrow circle of scholars and policy makers mainly to describe and compare national systems of innovation in countries with well developed institutional and infrastructural support for innovation activities (Lundvall et al, 2002; Johnson et al, 2003, p. 14).

Johnson et al (2003, p. 7), in discussing some controversial and critical characteristics of the innovation systems approach, point out that "the innovation systems is not a formal theory, in the sense of providing propositions as regards established and stable relations between well defined quantitative variables.... one position is to consider it to be an advantage that the concept is broad and flexible enough to serve as a framework for organizing knowledge ....and that innovation systems thinking may productively continue to thrive as appreciative theory while at the same time it draws upon elements of formal theory". Other authors make the same point, for example Clark (2002, p. 360) indicates that "the word system is employed as a kind of loose metaphor to describe broad relationships among relevant stakeholders whose activities affect innovation" or as expressed by Barnett (2006, p.9) "the innovation systems idea should be viewed as a metaphor for innovation diversity". As such there is no universal definition of innovation systems. However this chapter will use as a working definition that proposed by the World Bank because it explicitly includes most of the elements discussed in the rest of this section:

> "An innovation system can be defined as a network of organizations, enterprises and individuals focused on bringing new products, new processes, and new forms of organization into social and economic use, together with the institutions and policies that affect their behaviour and performance" (World Bank, 2007; p. xiv).

The systemic conceptualization of innovation distinguishes the innovation systems approach from earlier thinking on innovation in which technical change and other forms of innovation are viewed as an exogenous process driven by scientific and technical research (Johnson et al, 2003; Hall et al, 2006). Key distinctive conceptual insights of the innovation systems approach are discussed below highlighting its procedural, holistic, relational, interactional and institutional perspective on innovation.

2.2.1 Key conceptual insights of the innovation systems approach

A focus on process

As expressed by Barnett (2006, p.2) "the essential insight of the innovation systems approach is to switch attention from research to processes of innovation" or to switch attention from the production of scientific research outputs to the process of production, diffusion and application of knowledge (of all types) to achieve social and economic outcomes (Hall et al, 2006, p.13). This process is one in which "research becomes just one element of a wider process of transforming new knowledge into goods and services" (Barnett, 2006, p.2).

The process focus of the innovation systems approach distinguishes innovation from invention. While invention culminates in the creation of knowledge, innovation also encompasses the process through which this knowledge is put into use. While new knowledge can lead to brand new innovation (radical innovation), very often the process of innovation involves reworking the existing stock of knowledge, making new combinations that can lead to incremental innovation (Johnson et al, 2003; Edquist, 1997; Hall et al, 2006; World Bank, 2006). However, as expressed by Hall et al (2006, p. 13) knowledge, whether new or a combination of existing knowledge, cannot be considered innovation until applied. In simple terms, innovation can be seen as the process through which organizations and individuals convert an invention (creative idea) into goods and services

with economic and social significance to the users, whether these goods or services are brand new or a combination of existing ones.

A holistic perspective on knowledge production

The innovation systems approach introduces the idea that most of the knowledge needed for innovation does not come from organizations working in isolation, but from the interaction with other organizations to gain, develop and exchange various kinds of knowledge (Edquist, 2010, p. 5). This idea suggests that innovation is a process that requires multiple knowledge bases which may be scientific and technical, as well as other sources of knowledge, both tacit and codified (Hall et al, 2006, p. 13).

In the same vein, other authors like Gibbons et al (1994) and van Kerkhoff and Lebel (2006) indicate that knowledge production does not occur within the academic domain alone or inside disciplinary boundaries, but in negotiation with actors and organizations outside the academic domain and with other disciplines. As such, knowledge production is characterised by trans-disciplinarity, heterogeneity and organizational diversity (van Kerkhoff and Lebel, 2006, p. 453). It is argued in this regard, that the innovation systems approach's holistic perspective corresponds conceptually to the trans-disciplinary and heterogeneous nature of knowledge production suggested by van Kerkhoff and Lebel.

Hall et al (2001a) link the above discussion on knowledge production with the other two key insights of the innovation systems approach discussed in this section: the focus on interactions and relationships, and the focus on institutions. Hall and colleagues argue that "innovation increasingly takes place at the interface of formal research and economic activity" (ibid, 793), where neither knowledge creation and validation organizations, nor user organizations have primacy. Instead of that, they assert that what really impinges on knowledge flow and therefore on innovation, is the pattern of interaction and interactive

relationship between both, the rules and norms that govern such relations, and other contextual factors.

A focus on interaction and relationships

To understand the central importance that the innovation systems approach assigns to the patterns of interaction and relationships among actors and organizations involved in innovation processes, it is helpful to start by reviewing Norman Clark's (Clark, 2002) discussion about the meaning and use of the term system in the conceptualization of innovation. According to Clark (2002, p. 360) a system may be defined as "something that is made up of interconnected elements [individuals and organizations involved in innovation] ... [in which] the interacting elements are connected in an organized manner ... [and] affected by their participation". Accordingly, he argued that the word system in conceptualizing innovation processes "is employed as a kind of loose metaphor to describe broad relationships [and interactions] among relevant stakeholders whose activities affect innovation" (ibid, p.360).

In this account it can be said that the innovation systems approach focuses on how heterogeneous actors interact and relate to each other in the production, diffusion and application of knowledge with social and economic ends, on how interaction and relationships are organized, and on the factors affecting them. Within the process of innovation, the participating actors can play multiple roles whether as a source of knowledge, as a knowledge seeker, as a facilitator of interactions and relationships between others, or even combining the three roles at the same time. Additionally, the role that each actor performs and the relative importance of each role can vary as interaction and relationships evolve and learning take place (Hall et al, 2006, p. 14). Johnson et al (2003, p. 5) illustrate the importance of this discussion as follows: "the relationships may

be seen as carriers of knowledge and interactions as processes where new knowledge is produced and learnt".

Interaction and relationships provide a particular meaning to the learning process in innovation and in the creation of innovation capacities. The innovation systems approach strongly emphasizes the connection between learning and innovation and between learning capacities with innovation capacities (Lundvall, 2002; Edquist, 2010; Hall et al, 2008; Johnson et al, 2003; Clark et al, 2003). According to Johnson et al (2003, p. 10), a learning process forms the preconditions for innovation in the sense that "without learning there would be no knowledge to introduce into the economy as innovation". In these terms, the innovation systems approach recognises that knowledge acquisition arises from learning and that learning does not only arise from learning by searching, but also from learning by doing and from learning by interacting (Lundvall, 2002; Hall et al, 2006) through an interactive and non-linear learning process characterized by reciprocity and feedback mechanisms (Johnson et al, 2003; Edquist, 2010).

On the basis of these ideas it can be said that the extent to which actors are capable of learning interactively determines the extent they are able to innovate. In this sense, building innovation capacities involves interactive learning among individuals and organizations participating in innovation processes (Johnson et al, 2003, p.10) and learning capacities refers to the ability of the participating actors to continuously adapt their patters of interaction and relationships, as well as their ways of working and routines, to incrementally improve their ability to produce and utilise knowledge with social and economic ends (Hall et al. 2008, p.13). Both, learning and knowledge acquisition, and therefore actors' interactions and relationships and ultimately innovation, occur within or are conditioned by a set of institutions which, by governing the behaviour of individuals and organizations, constitute constraints and/or incentives for innovation (Edquist, 2010; Lundvall, 2002; Nelson and Nelson, 2002; Hall et al, 2006; 2008; Oyelaran-Oyeyinka,

2005). Commonly referred as to the 'rules of the game', institutions are formally defined by North (1996) as the "humanly devised constraints that structure human interaction" (ibid, p. 3) including for example laws, regulations, cultural norms, social rules, market rules, working habits and routines. The focus on institutions in the innovation systems approach is another key conceptual insight that distinguishes the approach from other more conventional ways of thinking on innovation. This distinctive aspect is discussed below.

A focus on institutions

The idea that institutions matter for innovation is central in the innovation systems approach and can be explained as follows. If one accepts the centrality of effective patterns of interaction and relationships among individuals and organizations in the interactive learning process entailed in the production, diffusion and application of knowledge, one should consider the values, working habits and routines determining actors' propensity to interact and relate each other. For example, Hall et al (2006, p. 14) illustrate this aspect by asking "do they [the organisations] have a tradition of interacting with other organisations or do they tend to work in isolation. Do they have a tradition of sharing information with collaborators and competitors, of learning and upgrading, or are they more conservative".

The focus on institutions also encompasses the wide range of policies and regulations affecting innovation (Spielman, 2005; Hartwich et al, 2007). For example, changes in the orientation of national policies determining the role of the state and public expenditure in science and technology as well as changes in market and production conditions such as price regulations, taxes and subsidies also shape the roles that other non-state organizations play in innovation, stimulate or inhibit private investment in research and development, and affect the formation and scope of public-private, private-private partnerships or other forms of multi-organizational interaction for innovation (World Bank, 2007; Montaño et al, 2007).

The discussion above introduces another key conceptual insight that distinguishes the innovation systems approach from other conventional models of innovation: the concept of institutional innovation. Barnett (2006, p. 6) defines institutional innovation as the process of "finding ways to do things in new ways. It may be the result of analysis and conscious efforts to change the rules of the game (including rules and regulations), but can also include the behavioural changes that occur spontaneously as people try to solve problems and learn from their experience". For their part Hall et al (2008, p. 13) emphasize the importance of institutional innovation in building innovation capacities by asserting that "a large element of this capacity arises from learning-by-doing, whereby organizations engaging in the innovation process continuously adapt ways of working and routines [institutional innovation] thus incrementally improving their ability to utilise knowledge and information". More broadly, Edquist (2010, p. 7) refers to institutional innovation as to the process of "creating and changing institutions that influence innovating organisations and innovation processes by providing incentives for and removing obstacles to innovation".

Finally, to bring together these different aspects, Smits (2002) offers an interesting way of combining the procedural, holistic, relational, interactional, and institutional nature of innovation into one definition: he defines innovation as the "successful combination of hardware, software, and orgware" (ibid, p. 865). Hardware relates to new technologies and practices; software to the diversity of knowledge and modes of thinking involved in the innovation (Klerkx et al, 2009a, p. 6; Klerkx and Leeuwis, 2009, p. 849); and orgware refers to the "organizational and institutional conditions that influence the development of an invention into an innovation and the actual functioning of an innovation" (Smits, 2002, p. 865). The orgware concept is of relevance for this research because, as discussed in Chapter 1, it focuses on the collective institutional innovation processes entailed in the

formation and operation of a particular type of orgware: the multi-stakeholder platforms subject of enquiry.

2.2.2 Brief review of the use of the innovation systems approach in developing country agriculture

While the innovation systems approach has been applied since the middle of the 1980s to describe and compare national systems of innovation in developed countries, its use in developing countries agriculture is much more recent. The growing use and the value of the approach in studying agricultural innovation processes and to inform policies in developing countries relies on the fact that the approach extends two other major frameworks of innovation capacity building: the National Agricultural Research Systems (NARS) and the Agricultural Knowledge and Information Systems (AKIS) (Spielman, 2005; Hall, 2007; World Bank, 2007).

A National Agricultural Research System is formed by all the organizations involved in research. The underlying idea is that agricultural research outputs, through technology transfer, lead to technology adoption and growth in productivity (World Bank, 2007, p. 28). The NARS perspective emphasizes the public goods nature of research outcomes, defines the role of the state and the private sector in research as mutually exclusive (Hall et al, 2007, p. 81), and assumes that the social and economic institutions in which the linear process of agricultural research, technology transfer and adoption occurs are exogenous and unchanging (Spielman, 2005, p. 9). According to the World Bank (2007, p. 28), "by emphasizing the development of the capacity of the research system, [the NARS perspective] tends to limit attention to other factors that enable new technologies to be used". In other words, the narrowed focus on agricultural research in the NARS perspective makes it unsuitable to study the interactions among heterogeneous actors and institutions involved in agricultural innovation.

Different from the NARS perspective, the AKIS perspective recognizes that research and other sources of knowledge contribute to technological change. As such, the perspective emphasizes the linkages between research, education and extension in generating knowledge and fostering technology adoption. It situates farmers at the center of the knowledge triangle formed by researchers, educators and extensionists, and focuses on the communication channels through which information and knowledge flows within the system (World Bank, 2007; Spielman, 2005). According to Engel and Salomon (1997, p. 31) the knowledge and information systems perspective has been constructed as a diagnostic framework to explore the organizational forms that enable and/or constrain knowledge and information generation, transformation and use. However, according to other authors, although the AKIS perspective is less linear than the NARS perspective, it is not broad enough to conduct analysis beyond the nexus of research, education and extension services. It also pays limited attention to the role of other sectors (market agents and other services providers) and does not consider the wider context of policies and institutions that constitute incentives or impediments for innovation (Spielman, 2005, p. 10; World Bank, 2007, p.30).

As expressed by Spielman (2005, p. 7) the innovation systems approach "opens the black box of innovation" in the sense that it is comprehensive, systemic and flexible enough to understand the wide range of determinants, processes and actors involved in innovation, and to understand the process that leads to the necessary conditions for innovation to take place in specific contexts. This ability widens innovation studies in scope and perspectives: for example Arocena and Sutz (2000) analyze how the critical features of the concept of innovation systems can be adjusted and used for studying the specifics of innovation processes and policies in Latin America; Hall et al (2001a; 2006), Rajalahti et al (2008) and Hartwich et al (2005) use the innovation systems approach to discuss the relevance of public-private partnerships in strengthening agricultural innovation in developing

countries; Hall et al (2001b; 2003; 2007), Hall (2005), Spielman (2005), Clark (2002), the World Bank (2007), Watkins and Ehst (2008) and Rajalahti et al (2008) all stress the centrality of institutional learning and institutional innovation in building innovation capacities in developing countries agriculture; and Hartwich et al (2007a) investigate agricultural innovation governance in Bolivia from an innovation systems conceptual perspective.

These studies vary in focus: some of them focus on studying agriculture and agricultural research in developing countries, others on the institutional arrangements in research and innovation and others on technological opportunities. However, all have in common that they embed the analysis of innovation within the institutional context in which innovation takes place. A cross-cutting feature in these studies is that authors coincide in affirming that bringing together a diversity of actors represents a potential for innovation and that the activation of this potential depends on whether the institutional setting in which innovation takes place impinges on or enables the pattern of interactions and relationships required for innovation (Johnson et al, 2003; Hall et al, 2006, World Bank, 2007). As discussed in Chapter 1, this aspect is at the core of the debate in the international agricultural research community and has given rise to the development, experimentation, and evolution of a variety of multi-organizational forms of collaboration, such as public–private partnerships, coalitions and research networks, among others (Horton et al, 2009, p. 1).

2.2.3 Gaps in the literature and the challenge of using the innovation systems approach with action-oriented purposes

As discussed in Chapter 1, development practitioners and researchers, including myself, face the challenge of how to put theoretical approaches into use in different and real life contexts. This applies to the innovation systems approach. The innovation systems approach as a metaphor for innovation diversity (Clark, 2002; Barnett, 2006; Clark et al,

2007), that integrates the wide range of determinants involved in innovation processes (Spielman, 2005), has been mainly used as an analytical framework to explore and explain different approaches to agricultural innovation (including the study of failures and successes of public research and technology transfer systems and other forms of multi-organizational collaboration for agricultural innovation) and to inform interventions aimed at strengthening agricultural innovation capacities (see the studies cited in the previous sub-section).

Authors in the World Bank's book entitled *Strengthening Agricultural Innovation Systems* (World Bank, 2007) use the findings from the application of the innovation systems concepts as referred to above, to develop a framework that proposes a set of principles for diagnosis and for designing interventions. In the same line, Paul Engel, Monique Salomon and others at the department for Communication and Innovation Studies of Wageningen University developed the Rapid Appraisal of Agricultural Knowledge Systems methodology (RAAKS) which has been widely used for innovative capacity development and social learning processes at the community level among rural organizations and institutions in Latin America, Africa and Asia (Engel and Salomon, 1997). However, the operational challenge of making the innovation systems ideas accessible to practitioners and researchers, along with the need for user-friendly guidelines that help them to put these principles into practice, has not yet been sufficiently addressed (Hall, 2007).

From the above discussion it seems that the difficulty of this challenge relies, at least partially, on: i) the difficulty of developing evidence-based guidelines that consider both the variability and complexity of the conditions in which agriculture and agricultural innovation takes place and the diversity of actors (public and private actors, NGOs, R&D organizations), approaches and initiatives engaged in agriculture and innovation; and ii) the difficulty of putting into practical and measurable terms complex concepts such as institutions and institutional innovation, capacity building, and interactive learning.

Although these concepts, imported from other theoretical perspectives, have been used and re-conceptualized to draw the flexible, comprehensive, holistic and interdisciplinary conceptual foundations of the innovation systems approach, and used mainly to study Western Europe countries' national innovation systems (Edquist, 2010; Johnson et al, 2003), less progress has been achieved in understanding how these concepts should be adapted, adjusted, and ultimately used in developing countries' different agricultural contexts, and less with action-oriented purposes.

In this regard, Hall (2007, p. 14) reports the need for a shift from the use of the innovation systems ideas following a "classic case study research/publication mode", to their use in action-research to explore "how to bring about the institutional and policy changes" needed for innovation. In the same vein, Horton et al (2009, p. 106) call for in-depth action-research studies to understand how actors engaged in a particular form of multi-organizational collaboration for innovation negotiate the institutional arrangements (the set of rules and procedures) that enable them to act collectively, and to understand the factors that affect such a process of institutional innovation. More formally, there is a knowledge gap about the process of institutional social capital formation needed for innovation, understanding institutional social capital as the roles, rules and procedures facilitating beneficial collective action for those involved in innovation (Krishna, 2000; Krishna & Uphoff, 2002).

This research seeks to contribute in filling this gap by studying in-depth two particular cases of institutional innovation: two cases of R&D project-driven attempts to foster the establishment and operation of multi-stakeholder platforms for innovation within the Bolivian context of agricultural innovation. However, because the innovation systems approach only refers to institutions and institutional innovation theoretically and does not offer practical insights for their study, this research uses concepts from the Institutional Analysis and Development framework to fill this gap (see Section 2.4). Thus, different

from other studies reported in the literature, this research provides empirical insights into the use of the innovation systems approach in designing in-depth action-oriented studies, and to the study of institutional innovation processes, when such processes are driven through R&D projects.

The discussion in the following sub-section introduces the second theoretical perspective informing the conceptual framework of this research: the collective action approach, whose key conceptual insights are discussed below.

2.3 Collective action approach

Numerous definitions of collective action are suggested in the literature. In fact the Collective Action and Property Rights Initiative (CAPRi)[1] offers a glossary[2] where numerous definitions can be found. For example Meinzen–Dick and Di Gregorio (2004) define collective action as the "voluntary action taken by a group to achieve common interests". Ostrom (2004) indicates that "collective action occurs when more than one individual is required to contribute to an effort in order to achieve an outcome; and Kruijssen et al (2007, p. 5) define collective action "as the coordinated behaviour of groups toward a common interest or purpose". Meinzen– Dick et al (2004, p. 200) identify common elements of the definitions, noting that "what most definitions have in common is that collective action requires the involvement of a group of people, it requires a shared interest within the group, and some kind of common action that works in pursuit of that shared interest".

The breadth of these definitions needs to be unpacked to conceptualize each of its constituent key conceptual components: the group, the shared interest and the kind of common action. In this vein, Poteete and Ostrom (2004, pp. 220-226) note that in researching collective action, clear conceptualization is needed about: a) the unit of

[1] A system-wide programme of the Consultative Group of International Agricultural Research (CGIAR)
[2] http://www.CAPRi.cgiar.org/glossary.asp

analysis (collective action by whom?); b) the variables affecting collective action (what affects collective action?); and c) the type of problems that people seek to solve collectively (collective action for what?). The discussion below addresses these points.

2.3.1 Conceptualizing the unit of analysis

Very often collective action is associated with or is easiest to identify when there is a clearly-defined group: a formal or informal organization. However, the presence of an organization does not lead necessarily to action, and collective action may occur spontaneously in absence of an organization (Meinzen–Dick et al, 2004; Hellin et al, 2007). For example, in researching collective action in natural resources the unit of analysis may be the group of individuals that uses the resource. However sub-groups may exist within the group that use the resource for different purposes: water and land for crop production or for livestock production. In agricultural production, collective action may take place through a farmer organization in which individual farmers act collectively to produce, store and sell a certain product, but also it may occur by coordinating activities among individual farmers and an external agent to deliver training services or to implement participatory research. Even more complex, the unit of analysis may be a network of NGOs dealing with public advocacy in human rights, or a partnership between public research organizations, universities and firms collaborating in technology development.

Given this breadth of possibilities, Poteete and Ostrom (2004, p. 221) assert that in research conducted in the field "researchers have to determine how to conceptualise – and recognise in the field - the relevant set of people for analysing the problem of collective action". Therefore, the determination of the appropriate unit of analysis will vary, depending on the nature of the collective action problem under consideration, and both, the unit and the problem, will guide the selection of the appropriate set of variables through

which the collective action problem will be studied (Meinzen–Dick et al, 2004; Poteete and Ostrom, 2004; Sultana and Thompson, 2004). The discussion below addresses this issue.

2.3.2 Recognizing the different nature and forms of collective action

Recognizing the nature of the collective action problem is crucial in researching collective action, whether collective action occurs through a clearly-defined group or not. On the one hand, collective action can be an event (one time occurrence), for example, when individual farmers, once a year, coordinate activities and define procedures to buy seed, or engage in some kind of collective action in response to external opportunities such as those offered by R&D projects, or to benefit from subsidies when they have been affected by floods or droughts. On the other hand, collective action can manifest itself as an institutionalized behaviour of a group, for example, the rules that members of a rural community use over and over again for the collective management of natural resources such as communitarian land or water for irrigation (Meinzen-Dick et al, 2004). Finally, collective action can be understood both as the process entailed in the formation of groups, or as the result of the relations of trust and reciprocity, common rules, shared knowledge and expectations, and patterns of interaction among the members of the group (Sultana and Thompson, 2004; Kruijssen et al, 2007; Grootaert and Bastelaer, 2002; Krishna 2004).

Whether an event, an institutionalised behaviour, a process, or a result, collective action can take various forms: the development of institutions, resource mobilisation, coordination of activities and information sharing (Poteete and Ostrom, 2004). These forms may take place either simultaneously or not, can be related one to each other and can be undertaken by groups in their own or facilitated by an external agent, such as governmental bodies, NGOs and R&D organizations.

How does the above discussion on collective action relate to the discussion on innovation? Innovation can be viewed as a result of collective action in the sense that it arise from the

interaction, relationship, knowledge exchange, interactive learning, and common rules among the actors involved in innovation. At the same, the collective action required for innovation can result from or can be fostered through institutional innovation, that is, by creating and changing institutions (rules and procedures) to provide incentives and to remove the obstacles that limit actors to act collectively. This idea is at the centre of this research's conceptual framework, and is used to explore the institutional innovation process of formation and operation of the multi-stakeholder platforms as a collective action process.

2.3.3 Studying factors affecting collective action

Most of the literature on collective action reports the attempts by researchers to identify and explain factors affecting the performance of groups in solving collective action problems in fields such as natural resource management, marketing and service provision. For example, factors affecting prospects for successful collective action in natural resources management, and commonly referred to in the literature, include: the characteristics of natural resources; the physical characteristics of the group, such as size and proximity to markets; the social attributes of the group, including heterogeneity, leadership, dependence of the group on the natural resource, internal institutional arrangements, patterns of interaction and relationships; the presence and actions of external agents, such as other organizations with interests upon the natural resource, NGOs, firms, and governmental agencies; and the institutional and policy setting in which the group operates (Agrawal, 2001; Poteete and Ostrom, 2004; Ostrom, 2004; Meinzen-Dick et al, 2004; Rasmuseen and Meinzen–Dick, 1995).

Marketing and service provision is another field in which collective action has been identified as important for agricultural development in developing countries. The literature reports that collective action can help small producers be more competitive especially

when they confront high cost of accessing markets, poor infrastructure, inadequate technology, or information barriers (Johnson and Berdegué, 2004; Barham and Chitemi, 2008; Devaux et al, 2009; Gruere et al, 2007; Hellin et al, 2007, Markelova et al, 2009). Studying associative peasant business firms in Chile, Berdegué (2001) found that successful collective action in terms of helping farmers to participate in new markets took place in those small farmer associations with the ability to develop and enforce effective and less costly internal rules, as well as rules that enable them to interact with the community in which the association is embedded and with external agents, such as NGOs, other public and private service providers and firms.

Studying collective action and innovation in the potato market chain in the Andes, Devaux et al (2009) identify the conditions that favour the emergence and outcomes of successful collective action in market chain innovation. Devaux and colleagues group the factors configuring these favourable conditions into four groups (ibid, p. 34):

i. external environment: support from external agents, appropriate policy incentives for market chain innovation, presence of community groups

ii. characteristics of the market chain; attributes of the commodity, potential to reduce transactions cost and for product differentiation and value addition

iii. characteristics of the participating market chain actors: high level of commitment, engagement and accountability of the participating actors and external agents; high level of dependence on the market chain; presence of social capital; and capable leadership

iv. institutional arrangements: locally devised rules, easy to understand and enforce, and consistent with market signals; fair allocation of costs and benefits of collective action; and effective interactive learning, interaction and relationships among market chain actors.

The similarity between the factors listed above and those referred as to affecting collective action in natural resources management seems to indicate consensus among authors in identifying the wide range of factors affecting collective action. However, Poteete and Ostrom (2004, p. 17) assert that "little consensus exists on the relative importance of factors or the nature and significance of interactions among them. The variety and number of factors associated with successful collective action while encouraging for social relations, make analysis difficult".

In this regard, the literature indicates that whether and how a particular factor or group of factors affects collective action can vary from one collective problem to another; and from one group to another even if the same collective problem is under consideration. In this sense, Agrawal (2001, pp. 1663 – 1964) highlights that different researchers might choose different factors to explain the same collective action problem depending on the context in which the phenomenon takes place; and each factor can be conceptualized and measured differently depending on the researcher's conceptualization of the unit of analysis, and of the nature and forms of the collective action problem under investigation.

The literature also indicates that because many of the factors affecting collective action are predominantly subjective (especially those related to the characteristics of the group), their conceptualization and measurement vary from one researcher to another (Poteete and Ostrom, 2004; Rasmuseen and Meinzen–Dick 1995, Meinzen-Dick et al, 2004). For example, how many members must a group have to be considered as a large group, or how can the level of trust be measured objectively? Regarding the heterogeneity of groups, some studies focus on economic inequalities, while others examine heterogeneity in values, knowledge and skills or interests. The next section picks up in particular on the aspect of heterogeneity.

2.3.4 Gaps in the literature on how to study heterogeneity, institutions and the role of facilitation in collective action.

Heterogeneity among the members of a group is one of the factors that receives great attention in the literature on collective action related to natural resource management. A common insight in the literature is that there is a debate on whether heterogeneity constrains or enables collective action (Poteete and Ostrom, 2004; Rasmuseen and Meinzen–Dick 1995, Meinzen-Dick et al, 2004; Agrawal, 2001; Markelova et al, 2009). For example, Baland and Platteau (1999) suggest that while heterogeneity in endowments has a positive effect on resource management, heterogeneity in identity and interests creates obstacles to collective action. In the same vein, Ruttan (2008) argues that while socio-cultural differences (ethnicity, class, cultural views) hinder collective action (ibid, p. 970), economic heterogeneity (economic inequalities in wealth, income, access to credit) can be expected to have positive effects (ibid, p. 980). For its part, Agarwal (2010, p. 68) analysing a range of successful cases of agricultural production collectivities from the transition economies and south Asia, suggests that small and socio-economic homogeneous groups favour collective production. And finally, Devaux et al (2009) assert that bringing together farmers, processing firms, R&D organizations, service providers, chefs and other actors represents potential for collective action in pro-poor market chain innovation.

All these examples illustrate that empirical evidence on how heterogeneity affects collective action is still ambiguous. In this account it seems that whether heterogeneity affects positively or negatively different collective action problems in different contexts, depends on, and interacts with the institutional arrangements developed and used by the players engaged in a particular form of collective action. Therefore, in-depth studies aimed at providing empirical evidence should not be narrowed to the effects of heterogeneity, but should also consider the institutional arrangements involved in the collective action

problem under consideration. However, practical insights on how heterogeneity, institutions, and the interaction between both, can be studied are still absent in the literature on collective action. In this regard, this research, far from seeking answers about whether heterogeneity affects positively or negatively collective action, aims to contribute with theoretical and practical insights to the design and implementation of in-depth studies on heterogeneity and institutions in collective action, when the collective action problem under consideration relates to institutional innovation processes.

In this regard, as discussed in Section 2.2, bringing together a diversity of actors represents a potential for innovation (Johnson et al, 2003; Hall et al, 2006, World Bank, 2007). Thus, heterogeneity can be seen as a desirable condition, and whether its potential value for innovation is activated and nourishes innovation depends on the institutional arrangements governing actors´ relationships and interaction. However, a clear conceptualization about what should be the nature of these institutional arrangements to exploit the value of heterogeneity is an issue insufficiently addressed in both the literature on innovation and in the literature on collective action.

Another aspect that deserves attention relates to the unit of analysis. The literature reviewed in this section (Poteete and Ostrom, 2004; Rasmuseen and Meinzen–Dick 1995, Meinzen-Dick et al, 2004; Agrawal, 2001; Baland and Platteau, 1999; Ruttan, 2008; Agarwal, 2010) reports on studies of heterogeneity mainly concerned with groups formed by one type of actor (i.e. farmer or villager organization acting collectively to produce and sell a certain product, demanding/contracting services or managing some common natural resource). However, less attention have been put on understanding heterogeneity in collective action when the unit of analysis corresponds to more complex groups such as networks, multi-stakeholder platforms, public-private partnerships or other forms of multi-organizational collaboration for innovation.

This research addresses the above two knowledge gaps by exploring the heterogeneity among the organizations participating in process of institutional innovation entailed in the formation and operations of multi-stakeholder platforms for innovation, the subject of inquiry in this research. However, as mentioned before, because the literature on collective action does not provide guidelines to study institutions, heterogeneity, and how both interact in institutional innovation processes, the Institutional Analysis and Development framework is also used in this research to fill this gap, and is discussed below.

Finally, the third gap of relevance for this research relates to the role of facilitation in collective action processes. According to the literature, facilitation can be seen as a driving force establishing the existence of enable conditions for players to work collectively, especially where specialised knowledge and skills are needed to undertake actions and to deal with actors outside the group, such as government offices and service providers among others (Meinzen-Dick et al, 2004; Kruijssen et al 2007, Barham and Chitemi 2008). However, the literature does not explicitly refer to how to study this role and the factors affecting how this role is performed. The need for expanding knowledge on this issue relates to this research because, as discussed in Chapter 1, many efforts aimed at building multi-organizational forms of collaboration to organize agricultural technology promotion and the process of innovation in developing countries, have been, and currently are, fostered or driven by R&D projects, and researchers and development practitioners engaged in these projects are increasingly called to act as facilitators. As will be discussed in Section 2.4, this research uses concepts from the literature of innovation brokers and boundary organizations to fill this gap in a particular case: the exploration of how and with what effects R&D projects affect the facilitation of the institutional innovation process of multi-stakeholder platforms formation and operation. Using these concepts, this research contributes to the study of the role of facilitation in innovation and collective action, when

this role is not played by an external or third-party agent, but by an actor that at the same time forms part of the group involved in the process of innovation.

2.4 Conceptual framework for researching collective processes of institutional innovation

This section explains how key elements in the innovation systems and collective action approaches were combined into a conceptual framework to guide the study of the two cases of institutional innovation considered in this research. To build the conceptual framework, the procedural, holistic, interactional and institutional perspective on innovation in the innovation systems approach was used to formulate a working definition of institutional innovation relevant to the research questions. This definition is the core element on which the other components of the conceptual framework were defined using insight in the collective action literature. These components are: the unit of analysis, the nature and forms of the collective action process under consideration, the factors affecting the process, and its expected results.

Finally, the conceptual framework was used to include and organize insights from other related theoretical developments, which are used in Chapter 7 to analyse and discuss empirical findings (presented in Chapters 5 and 6) and give answers to the research questions from a theoretical perspective.

2.4.1 Elements of the conceptual framework

The elements of the conceptual framework, by combining insights from the innovation systems and collective action approaches, allow the exploration of the institutional innovation process of multi-stakeholder platforms' formation and operation as a collective action process. These elements are:

- Institutional Innovation definition: the process in which heterogeneous actors interact and relate each other to develop, change, and enforce rules and procedures that enable them to act collectively.

- Unit of analysis: the group of heterogeneous actors involved in the process of formation and operation of the multi-stakeholder platforms

- Nature and forms of the collective action process: the process of development and enforcement of rules and procedures, which includes knowledge and information sharing, interaction and relationships among the actors participating in the process

- Defining the results of collective action: rules and procedures collectively developed and enforced.

- Factors affecting the collective process of institutional innovation: the institutional setting provided by the R&D projects; the facilitation of the interactions and relationships between participants.

All these elements are depicted in Figure 2.1.

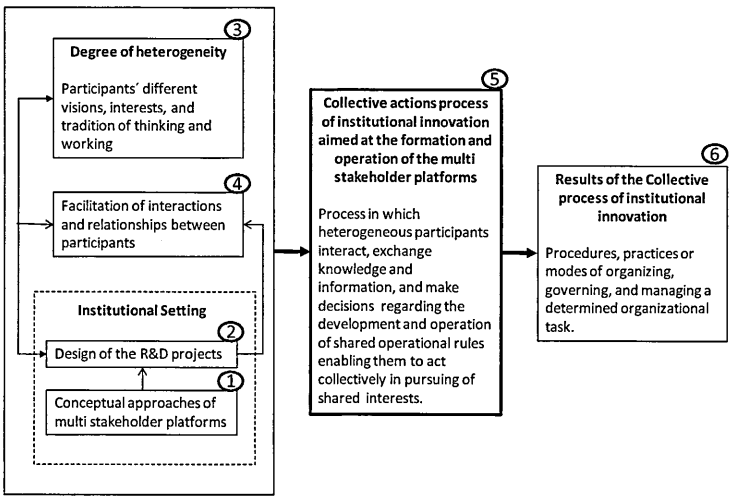


Figure 2.1 Elements of the conceptual framework

Following the figure, this research explored the process of formation and operation of the multi-stakeholder platforms as a collective action process in which multiple players came together to develop and operate shared rules and procedures enabling them to act collectively in pursuing of shared interests.

The development of such rules was seen as a process of institutional innovation in the sense that it involved heterogeneous players interacting together to bring a new form of organization into use. As such, this research is an in-depth study on heterogeneity and on the facilitation of relationships and interactions among the players involved in institutional innovation processes.

Finally, this research explored the role of R&D projects and the conceptual approach inspiring their design as the institutional setting affecting the pattern of interactions and relationships between participants and its facilitation.

2.4.2 Related theoretical developments

As discussed in Sub-section 2.2.4 the innovation systems approach does not offer guidelines on how concepts such as institutions and institutional innovation should be adapted, adjusted, and ultimately used with action-oriented purposes. In this account, insights from the literature on institutions and institutional analysis were included and organized within the conceptual framework to address the institutional component emphasized in the research questions. Along the same lines, these insights were also used to analyse how heterogeneity among organizations affected the process of institutional innovation entailed in the formation and operations of multi-stakeholder platforms, addressing in this way part of the debate regarding the role of heterogeneity in collective action.

Finally, because the focus on the role of facilitation in the research questions, and because the literature on collective action does not offer guidelines on how to study this role (as

discussed in Sub-section 2.3), the conceptual framework of this research includes ideas from the literature of innovation brokers and boundary organization to explore how and with what effects R&D projects affected the facilitation of the institutional innovation process of multi-stakeholder platforms formation and operation.

Institutions and institutional analysis

As discussed in Sections 2.2 and 2.3, institutions defined as informal and formal norms and rules governing people's behaviour and interaction (North, 1996; Ostrom, 2005) are at the core of the innovation systems approach and collective action thinking, because they configure incentives or obstacles to innovation and collective action. The literature includes under the term "institutions" the wide range of laws, rules, regulations, norms, cultural habits, values, attitudes, beliefs, and practices that affect all forms of people interactions, whether political, social or economic (North, 1996; Ostrom, 2005). This section uses the term "institution" in two complementary and mutually reinforcing senses:

- Institutions as the set of prescriptive rules defining what is required, forbidden and permitted to participants in a specific situation (Ostrom, 2005, p 16 – 18; Rasmussen and Meinzen – Dick, 2005, p.14)

- Institutions as the set of rules that participants in an organization use to carry out activities, making decision and solving problems. Referred to by Nelson and Nelson (2002, p. 271, 292) as "social technologies" or by Ostrom (2005, p. 17) as "working rules", these rules include procedures, practices or modes of organizing and managing determined organizational tasks.

Both definitions are of relevance for this research because the research aims to understand the process through which the heterogeneous actors involved in the formation and operation of the multi-stakeholder platforms, interacted and related each other to develop,

change, and enforce the prescriptive rules and procedures that enabled them to act collectively.

Another two concepts of relevance for this research and that need to be distinguished are the concept of institutional arrangements and institutional environment. Institutional arrangements are particular sets of rules that are set up for a particular situation and govern the way the participants in this situation interact (Dorward et al, 2002; 2005; Gandarillas, 2006), whereas "institutional environment represents the broader set of rules within which people or organizations develop and implement specific institutional arrangements" (Gandarillas, 2006, p. 22). Following the definitions and elements of the conceptual framework, institutional arrangements refers to the set of prescriptive rules and procedures that resulted from the collective action process of institutional innovation entailed in the formation and operation of the multi-stakeholder platforms; and the institutional environment within which the process took place was given by the R&D project and by the conceptual approach inspiring its design.

To put the concepts discussed above into practice, this research uses some elements of the Institutional Analysis and Development (IAD) framework (Ostrom, 2005; Polsky and Ostrom, 1999). This framework provides two useful concepts: the "action situation" and the "rules–in–use".

The action situation is referred as to the social space where participants with diverse preferences interact, exchange goods and services, solve problems, inform themselves, consider alternative courses of action, make decisions, take action, and experience the consequences of these actions (Ostrom, 2005, p. 14; Polsky and Ostrom, 1999, p. 15). The rules–in–use are defined as the rules used by participating actors in an action situation to order their relationships (Ostrom, 2005, p.16), or as the rules that affect a situation and the resulting outcomes generated by participants (Ostrom, 2010, p. 811). In analyzing the

rules-in-use in an action situation, the IAD framework focuses on the operating rules that are commonly observed and used by most participants and on the sources of these rules (Polsky and Ostrom, 1999, p. 15).

Seven types of generic rules are proposed:

- Position rules: affecting what are the positions or roles that actors play in a situation
- Boundary roles: affecting who are the participants
- Authority rules: affecting what actions are assigned to a position
- Aggregation rules: affecting how actions are linked to outcome
- Scope rules: affecting what outcomes are possible in this situation
- Information rules: affecting what information about the action situation is available to participants
- Payoff rules: affecting what costs and benefits participants incur when they take action in a situation.

Along with rules–in–use, the IAD framework indicates that the behaviour of individuals and groups involved in a certain action situation is also affected by the attributes of the community. These attributes include participants' values, preferences and expectations about the action situation, as well as the knowledge and information that they have about the action situation, and participants' beliefs about other participants in the action situation (Polsky and Ostrom, 1999, p. 18)

According to the conceptual framework, the process of formation and operation of the multi-stakeholder platforms corresponded to a R&D project driven collective action process of institutional innovation in which multiple players came together to develop and

implement shared operational rules enabling them to act collectively in pursuing shared interests. The process is represented in Box 5 in Figure 2.1 and corresponds to what the IAD framework refers as to the action situation. Also according to the conceptual framework, the process of formation and operation of the multi-stakeholder platforms was explored as affected by three main factors and by the interaction between them: i) the contents of the R&D project and its respective conceptual model (Boxes 1 and 2 in Figure 2.1); ii) the facilitation of the interactions and relationships between participants in the process (Box 3 in Figure 2.1); and iii) the attributes of the participants (Box 4 in Figure 2.1) which correspond to the rules–in–use and attributes of the participants in the IAD framework.

As discussed above, the institutional setting (the rules-in-use in the IAD framework) in which the process of formation and operation of the multi-stakeholder platforms takes place, is given by the R&D project and by the conceptual approach inspiring its design. Research and development projects are frequently used as an instrument to put conceptual models into practice, in the sense that they are used to prove, evaluate and adjust models in different contexts. To analyse the extent to which the critical components of a conceptual model are present in the design of the R&D project, this research uses the concept of 'fidelity of implementation' offered by the literature on evaluation. Fidelity of implementation refers to "the extent to which the critical components of an intended programme are present when the programme is enacted" (Century et al, 2010, p. 202). Critical components may relate to how the intervention is structured, the resources at its disposal, the ways in which the intervention is implemented, and the roles and behaviour of the organizations and individuals involved in implementation (Horton et al, 2013).

Then, to analyze whether the R&D project design was adopted by the different participants as the rules-in-use in the formation and operation of the multi-stakeholder platforms, and whether they were in contradiction or in line with participants' visions, interests, and

traditions of working and thinking, this research uses the concept of 'local adaptation of programme intervention' also offered by the literature on evaluation (Century et al, 2010; Horton et al, 2013). The concept refers to the process of adapting the critical components of the programme to the attributes of the socio – economic and political context into which the intervention is being introduced; the characteristics of the organizations or individuals involved, including their levels of knowledge and specialized capacities, innovativeness, prior experiences, felt needs, and attitudes about change; and the availability of resources needed for successfully implementing the intervention.

Innovation brokers and boundary work

According to the conceptual framework, the facilitation of the relationships and interactions between players (Box 4 in Figure 2.1) represents another factor affecting the collective process of institutional innovation aimed at the formation and operation of the platforms under study. The framework also indicates that the institutional setting affecting the pattern of interactions and relationships between participants and its facilitation is given by the R&D project design (Boxes 1 and 2 in Figure 2.1). To analyse the role of facilitation when institutional innovation processes are driven by R&D projects, this research uses the concepts of 'legitimacy' and 'ambiguity of functions problems' in brokering innovation, offered by the literature on innovation brokers (Klerkx and Leeuwis, 2008; Klerkx et al, 2009a; 2009b).

According to Hartwich et al (2007b, p. vii), the formation and operation of networks for agricultural innovation in developing countries require "third–party agents to bring partners together, motivate them, provide information, and organize space for negotiations". According to Klerkx and Leeuwis (2008, p. 367), third-party agents are individuals or organizations which sit between and connect different agents involved in innovations with the aim of overcoming information gaps, managerial gaps and cultural

and cognitive gaps in relation to innovation processes. In the same vein, Klerkx et al (2009a, p. 8) state that the role of such organizations is "one that is neither involved in the creation of knowledge nor in its use in innovation, but one that binds together the various elements of an innovation systems and ensures that demands are articulated to suppliers, that partners connect, and that information flows and learning occurs".

According to the literature, innovation brokers, intermediary organizations or third-party agents are often linked to research organizations, non–governmental organizations (NGOs) or donors. Because this type of organization is normally engaged in research or other activities associated with innovation processes, when they act as innovation brokers they may confront ambiguity of functions problems, or they can be viewed by other actors as competitors rather than as neutral or legitimate facilitators (Devaux et al, 2010; Klerkx et al, 2009b, pp. 414-415; Klerkx et al, 2009a, p. 12).

These concepts are particularly relevant to this research because of its focus on R&D project driven processes of institutional innovation. As asserted by Klerkx et al (2009b, p. 414) "a key factor for the legitimacy and credibility of innovation brokers is that they must have a trusted position as a relatively neutral honest broker [...] they should not become so involved with projects that they take over detailed management and take away ownership from the innovation network partners, and they should give equal attention to the goals and interests of each of the partners". On the other hand, ambiguity of functions problems arise when brokers perform simultaneously the function of brokerage and have overlapping functions with parties for whom they intend to broker, and hence may be seen as competitors instead of facilitators (Klerkx et al, 2009a, p. 12). These concepts are used in this research to analyze whether the R&D project as the institutional setting brings about ambiguity of functions and legitimacy problems and how they are perceived by the participating actors in terms of their causes, characteristics and effects.

Regarding the functions that an innovation broker should perform in supporting agricultural innovation, the literature proposes three groups of generic functions:

- Demand articulation: articulating innovation needs and visions and corresponding demands in terms of technology, knowledge, funding and policy (Klerkx and Leeuwis, 2009, p. 851; Klerkx et al, 2009a, p. 10).

- Network formation: facilitation of linkages between relevant actors (Klerkx and Leeuwis, 2009, p. 851). This function includes actions associated with the search, analysis and selection of possible partners within the context, as well as contacting and integrating them. The function includes the development of different schemes of coordination and collaboration between relevant actors.

- Innovation process management: enhancing alignment among actors from different institutional background (norms, values, incentives). This includes boundary work (translation, communication and mediation), knowledge brokerage and information sharing, establishing working procedures and decision making processes, and managing conflicts (Klerkx et al, 2009a, p. 10).

According to the conceptual framework, the process of institutional innovation should result in the development of rules and procedures enabling actors to govern and manage a determined organization's task (Box 6 in Figure 2.1). The generic functions outlined above are used to define the nature of these rules and procedures: the rules and procedures enabling platforms member to accomplish three generic functions: i) demand articulation; ii) network formation; and iii) innovation processes management.

The function of innovation processes management introduces the concept of boundary work. Boundary work or boundary management is referred to in the literature on boundary organizations as the work of communicating knowledge, values, and priorities; mediating

conflicts and problems; and translating information between actors from different institutional backgrounds (McNie et al, 2008; Kristjanson et al, 2008; Cash et al, 2003). Active, iterative and inclusive communication is crucial in mobilizing knowledge into action; translation is needed to foster mutual understanding; and mediation is needed to align divergent interest into shared visions, objectives and actions (Cash et al, 2003; Devaux et al, 2010).

On the other hand, boundary work is considered effective if it simultaneously enhances the salience, credibility and legitimacy of the information and knowledge produced and used by stakeholders (McNie, 2007). Credibility refers to the perceived scientific accuracy of the information; salience relates to the relevance of the information to the needs of the stakeholders; and legitimacy reflects the perception of stakeholders that the information was produced respecting stakeholders' divergent values and beliefs, and in an unbiased and fair way (Cash et al, 2003).

The concepts explained above (functions of communication, translation and mediation; and information credibility, salience, and legitimacy) are used in Chapter 7 to analyse the rules and procedures that resulted from the collective process of institutional innovation of formation and operation of the multi-stakeholder platforms (Box 6 in Figure 2.1).

2.5 Conclusions

As discussed in this chapter, the conceptual framework of this research was built combining key elements of the innovation systems and collective action approach to study a topic in which there is a claim for better understanding: the institutional innovation process entailed in the construction of the "orgware" required for innovation. By adopting this focus this research differs from other studies reported in the literature.

First, while the literature refers that greater level of homogeneity among group members enable collective action, this research focuses on a collective actions process where heterogeneity is a desirable condition.

Second, while most of the literature reports on studies analyzing the rules and procedures affecting collective action and innovation, this research focuses on the factors affecting the development of such rules and procedures. Additionally, in this regard, while the literature normally reports on the use of the IAD framework to study the collective and sustainable management of natural resources and related policies; this research adapts and applies key concepts of the framework to study processes of collective institutional innovation: a field not addressed nor in the literature about innovation, collective action, nor in the literature concerned with the use of the IAD framework.

Third, although the literature reports on the role and contributions of external agents in facilitating collective actions, it does not explicitly refer to how to study this role and the factors affecting how this role is performed. This research uses concepts from the literature of innovation brokers and boundary organizations to fill this gap in a particular case: the role of facilitation in collective processes of institutional innovation.

Finally, the fourth difference relates to the fact that all the theoretical insights discussed in this chapter are applied to study institutional innovation processes fostered or driven by R&D projects. This aspect is important not only because it has not been addressed in-depth, but also because R&D projects are, and will be in the short and medium terms, one of the most important instruments to support innovation in developing countries agriculture.

How the theoretical insights discussed in this chapter have been translated into a methodological approach, is discussed in the next chapter.

Chapter 3 Research methodology

3.1 Introduction

The need for in-depth action-oriented studies on institutional innovation processes at the level of particular forms of multi-organizational collaboration, the conceptual framework (discussed in Chapter 2), and the characteristics of the two cases subject of enquiry (outlined in Chapter 4), informed the methodological design of this research. I start the discussion of this design in Section 3.2 by justifying why I selected a particular research strategy and methods. These were informed by my interests and personal position as a practitioner with almost 20 years experience working on agricultural development in Bolivia and as a scientist working for the International Potato Centre (CIP). In Section 3.3, I discuss the theoretical basis on which multiple case study strategy was selected as appropriate to this research, and in Section 3.4 I discuss from a theoretical perspective the deductive-inductive logic and action-oriented nature of it.

How the theoretical discussion on Sections 3.3 and 3.4 was put into practice is the focus of Section 3.5. In this section I describe the interactive process of data collection and analysis through which this research proceeded as an interactive (non-linear) and progressive process of knowledge construction. Also in this section, I describe how I addressed problems of validity and reliability in conducting action-oriented research and particularly those associated with my personal position as CIP researcher and part-time PhD student.

Ethical issues are discussed in Section 3.6, and in the concluding section (Section 3.7) I summarize and reflect on the main elements of the methodological design of this research in correspondence with the common concerns and criticisms about the rigour of qualitative research.

3.2 Background and justification

Before discussing this research's strategy, approach, methods and process it is important to leave clearly explained where the research questions posed in Chapter 1 come from, and the reasons why a particular research strategy and methods were selected to answer them. The reasons had to do with my interests and personal position as a practitioner and scientist.

As a CIP scientist, I was directly involved in the conceptual development of the Papa Andina Model of multi-stakeholder platforms and in the design of the InnovAndes Projects used to put into practice the model in the Bolivian context. As a CIP researcher, I have been interested in exploring whether multi-stakeholder platforms can be promoted as a multi-organizational form of collaboration for agricultural innovation in Andean countries, whether, to what extent and with what effects R&D projects can be used to drive the formation and operation of the platforms in different contexts, and to gain evidence-based knowledge to improve the model and the R&D projects' design for future applications. This professional interest has informed how the research questions were developed, and the location of the research in Bolivia.

Considering CIP's research interests (translated into the research questions), my empirical knowledge, and that the formation and operation of multi-stakeholder platforms fostered by the InnovAndes project was in progress at the moment of designing this research's methodology, a case study strategy and a qualitative approach were selected. The theoretical basis informing this selection will be discussed in-depth in Sections 3.4 and 3.5.

Because of the CIP's and my own engagement with the InnovAndes Project and its participating actors, this research was thought to be useful not only to both interests, but also to the interests of the other actors involved. The interests of the participants were captured at the beginning of the field work phase and can be summarized as follows: "to

learn from our own experience to improve our future work". Consequently, action-oriented research methods were selected to accomplish this twofold purpose. The theoretical basis supporting this decision will be discussed in-depth in Section 3.5.

In adopting this methodological approach, I designed this research as a progressive process of construction of useful knowledge to answer the research questions and to be useful for the actors involved in learning from their experience and to improve their practice. In the process I acted as a facilitator, participants were seen as source of knowledge, instruments for data gathering and information sharing were functional to the construction of knowledge and adjusted as the process evolved.

I also assumed that the research's purpose and procedures should be in line with the participants' expectations regarding the usefulness and benefits of the research and that even the participants could make certain decisions regarding the progress of the research. However I also recognized that this approach entailed risks as well as advantages. The risks referred to the possibility of diversion from the central objectives of the research and the loss of independence in relation to the research subject. In addition to that, because my direct involvement in the design of the InnovAndes Projects, some members of the Bolivian Andean Platform (ANDIBOL) tended to see the research as a monitoring or evaluation activity in which I was the assessor and they were the evaluated. The advantages consisted in that greater level of participants' engagement and commitment might be achieved and therefore more meaningful data might be gathered. How these risks and advantages took place during the research and how they were faced will be discussed in Section 3.5.

Having chosen the research strategy and methods to investigate the Papa Andina Model and the InnovAndes Project and on the basis of the conceptual framework discussed in Chapter 2, I selected a second case. The formation and operation of multi-stakeholder platforms driven by the InnovAndes Project coexisted with other similar efforts in Bolivia,

initiatives from which the second case was chosen. The second case was the Continuous Innovation Model and the Continuous Innovation Programme, and was selected according to the following criteria:

i. The case should be in progress and should have been in operation a similar length of time to the Papa Andina Model and the InnovAndes Project
ii. The case should involve multiple players with multiple attributes
iii. The case should correspond to an attempt of putting into practice a conceptual model of multi-stakeholder platforms through a R&D project.
iv. I should have facilities to access the case and its players.

Theoretically, the rationale to consider multiple cases follows a replication logic (Yin 1994, p. 31). This is different from following a sampling logic where a representative sample of a population or universe is studied and the results are then statistically generalized to the universe. In the same vein, Thomas (1998, p. 323), explaining the concept of multiple case strategy, notes that "what you can do with case studies is theoretical generalization... in fact, the main point of multiple case studies is to challenge the theoretical ideas which have been developed so that the ensuing generalization can be that much stronger".

In this account, the theoretical ideas informing the conceptual framework discussed in Chapter 2 will be, on one hand, challenged by the two cases' empirical results, and on the other hand, will be used to see both cases from a theoretical perspective, complementing and situating empirical knowledge within a coherent theoretical framework.

Having discussed so far the empirical reasons and theoretical rationale why a multiple case study strategy, qualitative approaches and action-oriented research methods were selected to answer this research's questions, Section 3.3 moves on to explain in more depth the case study approach.

3.3 Case study approach

According to Yin (1994, p. 9), case study is viewed as an appropriate research strategy "when a how or why questions is being asked about a contemporary set of events over which the investigator has little or no control". Similarly, Robson (1993, p. 5) indicates that "case study is a strategy of doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence.... at the heart of this definition is the idea that the case is studied in its own right, not as a sample from a population, and that the multiple source of evidences produce not only quantitative data but copious amounts of qualitative data as well".

I adopted Yin's and Robson's definition in this research because:

i) the research questions were asked about a contemporary social phenomenon. The formation and operation of multi-stakeholder platforms form part of other governmental and nongovernmental initiatives of developing efficient forms of multi-organizational collaboration with the purpose of strengthening the Bolivian system of agricultural innovation (Chapter 4 discusses past and current trends in the Bolivian system of agricultural innovation).

ii) although it is possible to find research reports and grey material describing and assessing the performance and results of recent past initiatives and describing current efforts, in-depth studies with the potential of contributing theoretically and empirically well-grounded knowledge about the factors affecting the formation and operation of such forms of organizational collaboration, and to inform further developments, are commonly absent.

iii) an in-progress social phenomenon changes and evolves as participants learn, relate and interact with each other and in correspondence with participants' individual and collective behaviour. All these qualitative and subjective elements suggest

multiple narratives whose meanings can be explained and understood using qualitative approaches.

iv) the formation and operation of the multi-stakeholder platforms is complex in nature because it involves multiple players with multiple traditions of thinking and working, knowledge, objectives and interests, which in turn determine how the players construct their perceptions and understandings about, and ultimately shape, the processes in which they are involved. Complexity needs to be studied in its own right, not as a sample from a population, and multiple sources of evidence are required to explore and understand it.

Although a case study approach presents strengths, there are also weaknesses. Because of its intensive nature (the investigator can usually only focus on a small number of cases), and because its use commonly entails a close relation between researchers and the people involved in the phenomenon, the approach has been subjected to questions about the validity, reliability and generalizability of the findings that are produced (Robson, 1993; Yin, 1994; Thomas, 1998).

According to Robson (1993, p. 66) validity "is concerned with whether or not the findings are about what they appear to be about", and as noted by Yin (1994, p. 34) critics "often point to the fact that a case study investigator fails to develop a sufficiently operational set of measures and that subjective judgments are used to collect the data". Such a criticism refers to biases introduced by the investigator but also by the people involved in the investigation. For example, the type of answers provided by a respondent could be strongly influenced by what other people would think about the answer and whether or not respondents' relative position in the situation would be threatened. Similarly, a respondent might vary his or her answer depending on his or her interpretation about who the investigator really is, what the objectives of the research are, and how the research results could affect his or her own interests as well.

Similarly, biases and their sources have been used as arguments to criticize a case study's objectivity. A traditional view of objectivity can be exemplified as "put the research questions in such a way that neither the researcher, nor their colleagues and superiors can affect the answers" (Robson, 1993, p. 74).

However, assuming such a position could limit the degree of understanding that could be achieved by reducing the richness of information that can arise from multiple perspectives and from the interaction between the investigator and people involved in the phenomena. Because of that, in this research, objectivity and validity will be treated as matters that have to do with the management of subjectivities. As explained by Robson (1993, p. 74) "the criterion for objectivity is inter - subjective agreement ... where various accounts of participants with different roles (perspectives and expectations) in the situation are obtained by investigators who, by combining them with their own perceptions and understandings, reach an agreed and negotiated account".

This last idea refers to the importance of the use of multiple sources of evidence (Yin 1994; Woodhouse, 1998), whose most significant advantage according to Yin (1994, p. 92) is "the development of converging lines of inquiry or process of triangulation". This means that multiple sources are used to obtain evidence that supports other evidence. Alternatively, Thomas (1998, p. 330) notes that "triangulation is getting evidence on the same point from different points of view", opening the possibility of triangulating different sources of evidence to obtain different results, meanings and perspectives about the same point. This research adopts Thomas's definition of triangulation using multiple sources of data and multiple methods to collect it, in order to get contrasting and converging evidence that allows understanding the complexity of the two cases subject of inquiry (see Section 3.5).

Other approaches to validity adopted in this research were to open spaces for critical reflection with the participants within an interactive process of data collection and analysis,

and maintaining continuous and transparent communication and information exchange with the participants (see Section 3.5). Critical reflection, communication and information exchange allowed challenging data collected with other pieces of data, comparing the views of the researcher with those of the participants, and to be aware of convergences, divergences and surprises.

The concept of reliability can be explained as follows: research might be judged reliable if another researcher arrives at same findings researching the same case study and using the same procedures (Yin, 1994; Blaxter et al, 2006; Woodhouse, 1998; Thomas, 1998). Because its intensive nature, close interaction between the researcher and the participants, and its susceptibility to be biased by the researcher or the people involved, reliability is often hard to achieve and demonstrate in case study research if extensive records of every aspect of the research process are not kept rigorously (Blaxter et al, 2006; Woodhouse, 1998). In this account, each step of the interactive process of data collection and analysis through which this research proceeded was carefully documented, not only as a mean to achieve reliability but also as part of the communication and information exchange strategy, described in Section 3.5.

3.4 Research approach and methods

3.4.1 Quantitative and qualitative approaches

Quantitative approaches are usually associated with the scientific tradition of doing research. Normally using quantitative methods for data collection and analysis and based on hard data, cause – effect relationships between measurable variables are established to generate objective knowledge, based on positive facts and free of bias from the researcher's prejudices, interests or assumptions (Mayer, 1998; Blaxter et al, 2006; Bowling, 1997). Data collection in quantitative research follows standard sampling techniques and relies mainly on surveys, secondary data, experiments and questionnaires,

and theories are tested and findings are generalized statistically (Chambers, 2007; Yin, 1994; Bowling, 1997).

On the other hand, as expressed by Blaxter et al (2006, p. 64) "qualitative research is concerned with collecting and analyzing information in as many forms, chiefly non-numeric, as possible" about the meaning of a particular social phenomenon for the individuals involved ... using observation, ethnography, interviews and content analysis as instruments for data collection and analysis, qualitative research "tends to focus on exploring, in as much detail as possible, smaller number of instances or examples and aims to achieve depth rather than breadth" (ibid, 2006, p. 64).

The question of which method is best to investigate a particular social phenomenon is not solely about whether to use qualitative or quantitative techniques (Blaxter et al, 2006; Bowling, 1997), or as expressed by Chambers (2007, p. 9) "deciding between the value of qualitative precision in meaning versus the value of quantitative accuracy in measurement, should consider the approach or paradigm that underpins the research". Blaxter et al (2006, p. 58) illustrate this question in a very simple way: "an interview that is conducted within, say, a qualitative approach or paradigm will have a different underlying purpose and produce broadly different data from an interview conducted within a quantitative paradigm". In the same vein, Bowling (1997, p. 114) asserts that: "the question should not be quantitative versus qualitative methodology, but how to identify innovative strategies for combining different perspectives and quantitative and qualitative methodologies in a single study, while at the same time respecting the distinct branches of philosophical thought from which they are derived". Ultimately and at a practical level, methodological decisions depend on or reveal how the researcher understands social reality; which in turn is translated into the research purpose, questions and type of knowledge sought.

In the light of the theoretical discussion above and according to the purpose, questions and type of contribution to knowledge that this research seeks to offer, the methodological

design was drawn from within the tradition of qualitative approaches. It is argued that in adopting this approach, this research will contribute with multi-source, evidence-based knowledge to a deeper understanding of the complexity, and evolutionary and behavioural nature, of the institutional innovation process of formation and operation of multi-stakeholder platforms, when this process is driven through R&D projects. Multi-source, evidence-based knowledge will be achieved by combining instruments for data collection (organizational documentation review, questionnaires, semi-structured interviews, focus group sessions, participant observation, and workshops), and by getting evidence on the same point from different points of view: in other words, methodological triangulation and data triangulation, respectively. A detailed discussion of how triangulation was put into practice is offered in Section 3.5.

Having discussed from a theoretical perspective the approach adopted in this research, the next sub-section discusses the Action Research Method and the reasons why it was chosen to conduct this research.

3.4.2 Action-oriented research methods

Common to most of the definitions of action-oriented research methods reported in the literature is the engagement of the researcher and the individuals involved in a particular social situation in a systematic, interactive (non-linear) and progressive process of learning and knowledge construction that enable the individuals to improve their practices and understanding about the social situation in which they are involved (Winter and Munn-Giddings, 2002, p. 5; Bowling, 1997, p. 366; Abbott 1998, p. 219).

The systematic nature of the process means that the process needs to be planned and undertaken in a way that enables knowledge to constructed, added and reconstructed with the participants during the course of the research. As expressed by Winter and Munn-Giddings (2002, p. 8): "in order to achieve the balance between being systematic and

responsive action, research proceeds in a series of cycles that involve planning, action, observation, reflection and re-planning".

The non-linearity of action-oriented research refers to a process in which each step of the research process generates the knowledge basis for the design and implementation of the next step and that the design and use of instruments to gather and share information should be adjusted as the process evolves. Discussing the specific context where research is done in function of policy reform, Chataway and Joffe (1998, p. 228) note that: "If research is being done in the context of ongoing policy reform, policy initiatives may change during the course of the research. Researchers and funders will want to build in plenty of space for ongoing discussions about the design and progression of the research... This increases the extent to which you need to network with stakeholders and will mean that your communication strategy will be an even more integral part of your work".

In an even more practice-oriented way, Blaxter et al (2006, p. 67) describe action-oriented research as a process that "simultaneously involves the co-generation [participants and researcher] of new information and analysis, together with actions aimed at transforming the situation .... it is holistic and context bound, producing practical solutions and new knowledge as part of an integrated set of activities .... it is a way of producing tangible and desired results for the people involved, and it is a knowledge-generation process that produces insights both for researchers and the participants".

On the basis of the theoretical principles discussed above, this research has been designed as a progressive process of construction of useful knowledge for both the researcher and those involved in the formation and operation of the multi-stakeholder platforms under investigation. How this methodological action-oriented approach was put into practice, and how risk and advantages were managed, will be discussed in Section 3.5 of this chapter. Before that, the next sub-section discusses the logic adopted for data collection and analysis.

3.4.3 Combining deductive and inductive logics for data collection and analysis

This research adopted a combination of deductive and inductive logics for both data collection and data analysis. In using a deductive logic, the research's theoretical framework and questions are used to define the themes and arguments through which the research subject will be investigated and data collection focused. Then patterns within data are identified and analysed in correspondence with these theoretical themes and arguments. In contrast, in using an inductive logic themes and arguments are developed on the basis or linked to the data themselves (Braun and Clarke, 2006, p. 84; Fereday and Muir-Cochrane, 2006, p. 4). As referred to by Braun and Clarke (2006, p. 84) "while an inductive logic provides a rich description of the data overall, a deductive logic provides a more detailed analysis of some aspect of the data".

The importance of both in contemporary social science is emphasised by Bowling (1997, p. 109) as follows: "one does not necessarily begin with a theory and set out to test it, but one can begin with a topic and allow what is relevant to that topic to emerge from analyses". This logic is known as grounded theory, and refers to a "process of discovering theory from data that have been systematically gathered and analysed during the course of research... thus data gathering, analysis and theory have a reciprocal relationship" (ibid, p. 109).

Regarding the combination of deductive and inductive logics in social research, Fereday and Muir-Cochrane (2006, p. 4) note that the combination of both "complements the research questions of the study by allowing the tenets of the theoretical framework to be part of the process of deductive identification and analysis of themes within the data while allowing for themes to emerge direct from the data in an inductive way".

In the light of these theoretical insights, I adopted a combination of deductive and inductive logics for data collection and analysis because of its correspondence with the

systematic, interactive (non-linear) and progressive nature of the process of construction of useful knowledge. This decision is in line with how Tobin and Begley (2004, p. 391) describe qualitative research: "a dynamic and interactive process in which the researcher is constantly moving back and forth between design and implementation to ensure congruence among question formulation, literature, recruitment, data collection strategies, and analysis". In the same vein, Morse et al (2002, p. 17) refer to this interactive process as the "mechanisms used during the process of research to incrementally contribute to ensuring reliability and validity and, thus the rigour of a qualitative study".

3.5 Research process

In the light of the above theoretical discussion, data collection and analysis in this qualitative-deductive-inductive action-oriented research was simultaneously carried out during the field work phase. The process was divided in two main stages: stage 1, approaching the cases; and stage 2, understanding the cases.

3.5.1 Stage 1: Approaching the cases

Through organizational documentation review (projects documents, internal regulations, minutes of meetings, among others), this stage sought to understand how both cases have come into being. As mentioned before, both cases corresponded to attempts to put into practice conceptual models of multi-stakeholder platforms: the Papa Andina Model and the Continuous Innovation Model, through the implementation of R&D projects: the InnovAndes Project, and the Continuous Innovation Programme. The InnovAndes Project gave rise to the formation of the Bolivian Andean Platform (ANDIBOL) and the implementation of the Continuous Innovation Programme gave rise to the formation of the Steering Committee of the Continuous Innovation Programme in Cochabamba (the CD-PIC, for its Spanish acronym) at departmental level, and to the formation of the Native

Potatoes Local Platform and Peach Local Platform, at local level. The main features of the models, projects and platforms are outlined in Chapter 4.

Data collection and analysis in the approaching the case stage

Data collection (based on document review) and analysis in this stage followed a deductive logic. The conceptual framework discussed in Chapter 2 indicates that the institutional setting affecting the formation and operation of the multi-stakeholder platforms is given by the R&D project and by the models inspiring its design, in the sense that they provide guidelines regarding critical aspects of the platforms. Accordingly, on the basis of the concepts of fidelity of implementation and local adaptation of programme intervention also discussed in Chapter 2, data collection through literature and organizational documentation review aimed to identify the extent to which the critical elements of the models had been adopted, adjusted or changed in the R&D projects´ design, searching for differences and similarities between both, and to identify whether the platforms came to life in accordance with the models, the projects or both.

Five themes were defined to guide data collection about the platforms; the:

i. purpose
ii. composition
iii. functions
iv. members´ role and position
v. procedures

Then, patterns within data were identified and analysed in correspondence with the above theoretical themes. Table 3.1 shows the template used for data analysis.

Table 3.1 Stage 1 data analysis template

Themes	Model's guidelines regarding:	R&D project design's guidelines regarding:	How did the platforms come to life regarding?:
Platform's purpose			
Platform's composition			
Platform's functions			
Platform members' role and position			
Platform's procedures			
Other themes			

The evidence from this stage (stage 1) configured the first picture of, initial approach to or the knowledge basis about how the institutional innovation process for the formation and operation of the multi-stakeholder platforms had come into being. The evidence formed the basis on which stage 2 was designed and conducted.

3.5.2 Stage 2: Understanding the cases

This stage was designed according to the principles of the action-oriented research methods discussed in Section 3.4. The operation of the multi-stakeholder platforms studied in this research was an in-progress process at the moment of data collection and involved the participation of multiple players with multiple attributes. Therefore, this stage sought to understand the process from the perspective of the stakeholders involved in a way that useful knowledge for both the researcher and the stakeholders emerged progressively as data was collected and discussed with participants.

At this point it is important to highlight the advantages and difficulties encountered in adopting an action – oriented research approach to study the both cases. These advantages and difficulties derived from my position as a CIP scientist, the degree of my involvement with the cases, and my position as a PhD student.

Before starting the investigation, I already knew and had developed relationships with the participating actors in the Bolivian Andean Platform as a result of my involvement in the design and implementation of the InnovAndes Project. This background helped me to be considered as committed to the interests of the platform, and having the knowledge and legitimacy to lead the research. This aspect was significantly beneficial for communication and information exchange with the actors during the research process and when time for data collection and analysis was requested. However, because of my position as a CIP scientist, some actors were less willing or hesitated to express negative opinions regarding the project and the platform, thinking that the investigation might be a kind of traditional performance evaluation and that their negative views could jeopardize the financial support channelled through the project. Similarly, because the CIP was acknowledged mainly by its commitment in helping farmers to solve their technological constraints in production, and by its long tradition of working with national R&D organizations through R&D projects, some other actors, especially those with less or no relation with the CIP in the past, expressed their concern about the neutrality with which the research would be carried out.

This research was the first time that I approached directly and formally the actors participating in the second case: the Steering Committee of the Continuous Innovation Programme in Cochabamba, the Native Potatoes Local Platform and the Peach Local Platform. However, because of my position as a CIP scientist, the actors saw me as representative of an organization with acknowledged scientific research capacities and they also felt encouraged by the fact that their experience was being selected as a case study for doctoral research. As in the Bolivian Andean Platform, this aspect was beneficial to the research since it stimulated the actors to be willing to be part of it, providing information and spending time during data collection and analysis. However, some actors expressed their concern regarding whether the research, besides seeking scientific and academic

purposes, would also serve their more practical interests. In other words, there was a concern about the extent to which the research would be beneficial to them.

To address these difficulties, the following methodological measures were implemented during data collection and analysis:

1. Monitoring participants' perceptions about the research: even though the objectives, theoretical basis, and methodological approach of this research had been presented and discussed before starting data collection and analysis in starting meetings held with each platform, and despite the fact that my interests, role and position as well as of those from CIP had been discussed along with the interest of the participants at such moment, it became necessary to discuss all these issues and monitor how they were perceived by the participants in each of the stages through which the research process unfolded.

2. Communication and information exchange: maintaining continuous and transparent communication and information exchange with the participants about the progress of the research and preliminary findings was a permanent and deliberate effort. Special attention was put in making clear and explicit my own opinions and perceptions about the data collected and analyzed in each stage, as well as in highlighting participants' convergences and divergences in opinion, and surprises found in the data.

3. Opening spaces for discussion and reflection: within the interactive process of data collection – analysis – collection – analysis, through which each step was developed, critical reflection with the participants (both individually and collectively) was promoted. For example: preliminary analysis of the information collected through questionnaires was discussed in-depth through individual interviews. Interviews' results were then tested and adjusted using meeting

observation, adding new information that, once analyzed, was collectively discussed in workshops with all the participants. Critical reflection and discussion allowed me to compare my views with those of the participants, looking for data reinforcing or contradicting other pieces of data, and looking for data that allowed me to explain convergent and divergent views.

4. Keeping the research process flexible: to be consistent with the interactive process of data collection and analysis and to allow critical reflection and discussion with the participants, the selection of instruments for data gathering was done as the process evolved. To select the instrument that best suited to a particular step, not only the results of a previous step were considered, but also the opinion of the participants about the progress of the investigation, their preferences, their time availability and their economical, cultural and social background.

It is important to note that although an action-oriented approach was adopted, the action-research cycle was not totally completed. As it was discussed above, the action-oriented process was guided in a way that it enabled critical reflection at various stages, which in turn gradually built up my own and the participants' understanding, and also allowed procedures for data collection to be adjusted as the process of knowledge generation evolved. However, because of the scope of the research questions, my time constraints as a part-time PhD student and other work demands as a CIP scientist, no practical solution or actions aimed at improving or transforming participants' practice were analysed and implemented.

Data gathering and analysis during this stage proceeded in two steps: step 1, exploratory step; and step 2, deepening step.

Step 1 Exploratory step

In the conceptual framework developed in Chapter 2, the heterogeneity in participants' attributes (vision, interests, and traditions of working and thinking) was considered as one of the factors affecting the institutional innovation process entailed in the formation and operation of the platforms (Box 3 of Figure 3.1). Consequently, this step sought to explore two aspects: i) how each participant had built their own understanding and expectations about the objectives and functions of the platforms and about their own roles, after three year of operation in the ANDIBOL case, and after two year in the case of the CD-PIC and Local Platforms; and ii) whether each participant perceived the objectives, functions, procedures and members' role and position with which the platforms came to life in line or in contradiction to their understanding and expectations.

Data collection and analysis in the exploratory step (step 1)

Depending on the platform and type of platform member, different instruments for data collection were used in this step. Table 3.2 shows the instruments used for data collection.

Table 3.2 Step 1 data collection instruments

Instruments for data collection	CD-PIC	Native Potato Local Platform	Peach Local Platform	Supporting organizations and firms participating in ANDIBOL	Farmers' organization participating in ANDIBOL
Electronic questionnaire[1]				√	
Face-to-face interview[2]	√			√	
Focus group: brainstorm, voting exercise and open discussion[3]		√	√		
Focus group: semi-structured group discussion[4]					√

[1]See Appendix 1 for electronic questionnaire protocol and list of respondents
[2]See Appendix 2 for interview protocol and list of respondents
[3]See Appendix 3 for focus group protocol and list of participants
[4]See Appendix 4 for focus group protocol and list of participants

In selecting the instruments listed in Table 3.2, I carefully considered the preferences, time availability and cultural and social background of the participants as well as my own experience and feasibility of application. I started by sharing with the participants the objective and themes considered in this step and proposing different instruments to gather information. This was done during a regular meeting of ANDIBOL and CD-PIC. CD-PIC members agreed on having individual face-to-face interviews to discuss the themes included in this step. The representatives of the supporting organizations and firms participating in ANDIBOL also did; however they proposed to have an initial approach to the themes by answering some key questions electronically, answers that would be used later for in-depth discussion during interviews. This proposal gave rise to the electronic questionnaire.

According to the literature, face-to-face interviews in qualitative research are normally used to gather information from those who know best or have as much information as possible about a particular topic. By talking with different respondents (selected because they know best about the topic) the researcher is seeking as wide a range of different viewpoints as possible to build as much comprehensive knowledge as possible about the topic under investigation (Bowling, 1997, p. 230; Woodhouse, 1998, p. 132).

A face-to-face interview can be seen as an in-depth topic-bounded conversation. Within the boundaries the researcher guides the conversation in an unstructured, semi-structured or highly structured way depending on whether the conversation is guided using open-ended questions, fixed questions and pre-coded responses, or a combination of both. According to Bowling (1997, p. 231) "open-ended questions in semi-structured interviews enable respondents to give their opinion in full on the topics proposed by the interviewer". In this research, this exploratory step used open-ended questions because its primary concern was to collect as much information as possible about platform members' different viewpoints.

The use of questionnaires in interviewing people can be seen as a highly structured interview, which involves the use of fixed questions, valuation scales or any other forms of questions with pre-coded response choices (Bowling, 1997, p. 228). In a structured survey, questionnaires are normally applied to a representative sample of a wider population to gather descriptive information and when comparative data is needed (Woodhouse, 1998, pp. 131-139) In this research no sampling considerations were made, because the questionnaire was applied to all the representatives of the supporting organizations and firms participating in ANDIBOL and the questionnaire included both fixed and open-ended questions. The answers to the fixed questions in the questionnaire were synthesized in simple tables and then showed for discussion during interviews and those to the open-ended questions were used to guide the conversation and to check whether what an individual said during the face-to-face interview corresponded or not to what she or he had said in the questionnaire.

On the other hand, the representative of the farmers' organization attending the meeting of ANDIBOL advised that group discussion with farmers' leaders would be the best way to address the themes and that, because of leaders' time and transportation constraints, the discussion should be held in the field. Although I received similar advice to conduct the discussion with the members of the Native Potato and Peach Platforms, I used different instruments in carrying out focus group discussions, taking in to account the diversity of the social and cultural background of the participants. While in the ANDIBOL case a semi-structured group discussion was held with individuals with similar backgrounds (farmers' leaders), in the case of the Native Potato and Peach Platforms the use of other techniques such as brainstorming and a voting exercise was necessary to gather data from participants with different cultural and social backgrounds, that is: representatives of farmers' organizations, local governments, and R&D organizations.

Focus groups can be seen as a topic-bounded group discussion in which the interaction between the participants stimulates recall, new perspectives, convergent and divergent views and opinions about the topic (Bloor et al, 2001; Anderson and Arsenault, 1998; Bowling, 1997). Focus groups have limitations, mostly related with moderator bias and leaders' influence. As discussed above, these limitations were overcome using techniques that enabled all the participants to express their opinion.

After transcribing each interview, synthesizing the results of the brainstorming and voting exercises into tables and transcribing group discussions, data analysis aimed at identifying convergences and divergences, their causes and effects, in relation to how each participant had built their own understanding and expectations about the objectives and functions of the platforms and about their own roles and position, and whether each participant perceived the objectives, functions, procedures and members' roles and positions with which the platforms came to life, in line with or in contradiction to their understanding and expectations. Then the process moved on to analyse patterns within the data (convergences, divergences, causes and effects emphasized by the respondents) to inductively identify the themes through which the operation of the platforms could be researched in-depth in the next step.

Each transcription, including my own opinion about the data collected and analyzed, as well as highlighting convergences and divergences and my proposal of themes, was then sent electronically to each interview respondent (CD-PIC members and representatives of supporting organizations and firms participating in ANDIBOL), asking for corrections and additions. In addition to this, the document sent to the respondents also included data from the focus group discussion held with farmers in the ANDIBOL case and with local actors in the case of the Native Potato and Peach Local Platforms. The purpose of sending the interview transcriptions was twofold: i) to adjust from the perspective of "who knows best" preliminary findings and the themes through which the operation of each platform could be

researched in-depth; and ii) to enhance communication and information exchange with the participants in order to reinforce their engagement in the process and their perception about the usefulness of the research. Table 3.3 corresponds to the template used for data analysis in this step and Table 3.4 lists the themes that emerged from data analysis and the interaction with the participants, which are those that were then explored in-depth in the next step.

Table 3.3 Step 1 data analysis template

	Convergences	Divergences	Causes	Effects
Platform's purpose/objectives	– Patterns within the data – Source and type of evidence			
Platform's composition				
Platform's functions				
Members' roles and position				
Other themes				

Table 3.4 Themes to research the platforms in-depth

Themes to research the Bolivian Andean Platform (ANDIBOL) in-depth	Themes to research the Steering Committee of the Continuous Innovation Programme in Cochabamba (CD-PIC), the Native Potatoes Local Platform and the Peach Local Platform, in-depth
1. ANDIBOL's structure of relationships between members	1. CD-PIC's and Local Platforms' fulfilment of functions
2. ANDIBOL's members participation	2. CD-PIC's decision making process
3. Decision making process within ANDIBOL and the role of facilitation	3. CD-PIC's mechanisms of participation
4. ANDIBOL internal management	4. The role of facilitation within the CD-PIC and Local Platforms

Step 2 Deepening step

I designed this step to gather and analyse data about participants' different views about the operation of the platform in relation to the themes identified in the previous step (Table 3.4). As in step 1 and according to the conceptual framework discussed in Chapter 2, this step focused on exploring the influence of the heterogeneity in participants' attributes in how each participant had built their own understanding and expectation about the operation

of the platforms and on whether they perceived such operation in line or in contradiction to their understanding and expectations.

Data collection and analysis in the deepening step (step 2)

Depending on the platform, type of platform member and themes to be explored, different instruments for data collection were used in this step. I used the same strategy as in step 1 to select the instruments that best suit to the preferences, time availability and cultural and social background of the participants as well as to my own experience and feasibility of application. Additionally I considered the advantages and problems faced in the previous step in using face-to-face interviews, electronic questionnaires and focus groups for data collection.

Tables 3.5 and 3.6 show the use of different instruments for collecting, sharing and deepening information about the themes around which the operation of each platform was progressively researched with the participants. This interactive process of collecting, sharing and deepening information was the strategy I used to allow critical reflection and discussion with the participants, which in turn allowed me to compare my views with those of the participants, looking for data reinforcing or contradicting other pieces of data, and looking for data that allow explaining convergent and divergent views. For example, the information collected through the electronic questionnaire was then discussed in-depth during interviews and new information was provided by the interviewees, which in turn was tested and adjusted during meeting observation. In the same vein, the realization of workshops was effective in creating opportunities for an open debate and critical reflection that allowed participants to articulate different perceptions about the themes explored in this step.

The process was also used as a communication and information exchange strategy with the participants, and to monitor participants' perceptions about the usefulness of the research.

For example, the preparation of summaries of the data gathered through the electronic questionnaires, and sending the transcript of the interviews, asking each interviewee for their comments, suggestions and additions, were effective in reinforcing the participants' roles within the research as sources of knowledge rather than as sources of information.

Table 3.5 Step 2 instruments for collecting, sharing and deepening information. ANDIBOL case

<table>
<tr><th rowspan="2">Themes</th><th colspan="4">Collecting, sharing and deepening information</th></tr>
<tr><th colspan="3">With representatives of supporting organization and firms</th><th>With farmers' organization</th></tr>
<tr><td>1.ANDIBOL's structure of relationships between members</td><td rowspan="3">Electronic questionnaire[1]</td><td rowspan="3">Face-to-face interview[2]

Meeting observation</td><td rowspan="3">Sending interview transcription for corrections and additions</td><td rowspan="3">Focus group: semi- structured group discussion[3]</td></tr>
<tr><td>2.ANDIBOL's members participation</td></tr>
<tr><td>3.Decision making process within ANDIBOL and the role of facilitation</td></tr>
<tr><td>4.ANDIBOL internal management</td><td colspan="4">Workshop with all the platform members</td></tr>
</table>

[1]See Appendix 5 for the electronic questionnaire protocol and list of respondents
[2]See Appendix 6 for the interview protocol and list of respondents
[3]See Appendix 4 for the focus group protocol, and list of participants

Data analysis in this step was progressively carried out during the interactive process of collecting, sharing and deepening information discussed above and at the end of data collection. Data analysis at the end aimed at identifying convergences and divergences, their causes and effects, in relation to how each participant had built their own understanding and expectations about the operation of the platforms and on whether they perceived such operation in line or in contradiction with their understanding and expectations.

Table 3.6 Step 2 instruments for collecting, sharing and deepening information. CD-PIC and Local Platforms

<table>
<tr><th rowspan="2">Themes</th><th colspan="4">Collecting, sharing and deepening information</th></tr>
<tr><th colspan="4">CD-PIC</th></tr>
<tr><td>1.CD-PIC's fulfilment of functions</td><td rowspan="2">Electronic questionnaire[1]</td><td colspan="2" rowspan="2">Face-to-face interview[2]</td><td rowspan="2">Sending interview transcription for corrections and additions</td></tr>
<tr><td>2.CD-PIC's decision making process</td></tr>
<tr><td>3.CD-PIC's mechanisms of participation</td><td rowspan="2">Meeting observation</td><td colspan="2" rowspan="2">Face-to-face interview with key informants</td><td rowspan="2">Sending interview transcription for corrections and additions
Presenting and adjusting information in CD-PIC regular meeting</td></tr>
<tr><td>4.The role of facilitation within the CD-PIC</td></tr>
<tr><td></td><td colspan="2">Native Potato Local Platform</td><td colspan="2">Peach Local Platform</td></tr>
<tr><td>1.Local Platforms' fulfilment of functions</td><td colspan="4">Focus group: brainstorm, voting exercise and open discussion[3]</td></tr>
<tr><td>2.The role of facilitation within the Local Platforms</td><td colspan="4">Face-to-face interview with key informants</td></tr>
</table>

[1]See Appendix 7 for the electronic questionnaire protocol and list of respondents
[2]See Appendix 8 for the interview protocol and list of respondents
[3]See Appendix 9 for the focus group protocol and list of participants

Using a deductive logic on the basis of the conceptual framework discussed in Chapter 2, I defined the conceptual themes to analyse the convergences, divergences, causes and effects emphasized by the participants. In this sense, the process focussed on analysing how and to what extent convergences and convergences among participants, their causes and effects, corresponded to the combined influence of: i) the guidelines provided by the conceptual models of multi-stakeholder platforms and the R&D project design used to drive the process of formation and operation of the platforms; ii) the degree of heterogeneity among the participants involved in the process; and iii) the facilitation of the interactions and relationships among participants within the process. Table 3.7 shows the template used for data analysis in this step.

Table 3.7 Step 2 data analysis template

	Convergences	Divergences	Causes	Effects
The influence of the guidelines provided by the conceptual models the R&D project design				
The influence of the degree of heterogeneity among the participants	– Patterns within the data – Source and type of evidence			
The influence of the facilitation of interactions and relationships				
Other influences				

Challenges and problems were faced in applying the process of data collection and analysis discussed so far. For example, responses to the electronic questionnaires and fit with the transcription of interviews took much longer to arrive at than expected, and individual interviews, workshops as well as focus groups were difficult to arrange because of my own and participants' time constraints. In fact, they were postponed more than once. In addition, the opportunities to observe the members in action, present and adjust information depended on the frequency of meetings. While platforms are scheduled to meet every month, often the meetings were less frequent and even not in all the meetings I attended, was it possible to address issues associated with the research. A big challenge faced was to maintain the interest of the participants. Often the topics that I wanted to discuss competed with problems that platforms members wanted to solve with relative urgency, shifting the discussion of the research themes or postponing it for another occasion. Another challenge was to understand how each participant understood the objectives of the research and its related concepts and then to build and adjust a common language for individual and group discussions. Finally, it was also challenging to maintain a researcher's perspective, avoiding pressures from some participants to give recommendations as an assessor.

The final step in analyzing the data was to integrate the findings in the thesis, which analyses them in three separate chapters. Chapter 5 discusses the findings on the ANDIBOL case and Chapter 6 those regarding the CD-PIC and Local Platforms case.

Then, Chapter 7 analyzes the findings of the both cases in the light of the conceptual framework discussed in Chapter 2, addressing the questions that this research seeks to answer.

3.6 Research ethics

Research ethics are about being clear about the nature of the agreement the researcher enters with the research subjects or contacts (Blaxter et al, 2006, p. 158): "Ethical issues relate to protecting the rights and privacy of individuals and avoiding harms" (p. 161) and "involve getting the informed consent of those that the researcher is going to interview, question, observe or take material from, and reaching agreements about the uses of this data, and how its analysis will be reported and disseminated" (p.159). This research followed the ethical guidelines of the Open University from which an ethical approval was obtained in May 24th, 2011.

At the beginning of the field work phase, an informed consent letter was signed by each of the individuals (all platforms' members) who would participate in the research (see Appendix 10). In the case of farmers participating in ANDIBOL, the letter was signed by the president of the farmer's organization in the platform, and in the Native Potato and Peach Local Platforms by their respective presidents. By signing the letter the participants expressed that: i) they agreed in participating in the research providing information; ii) they were informed about the purpose of the research and the instruments that will be use for data collection and analysis; iii) they knew that they could refuse to participate at any time by simply saying so; iv) confidentiality will be protected; v) they agreed that the information they provided could be used for educational and research purposes; and vi) they could contact me and my supervisors at any time.

Although the informed consent letter fulfilled standard research ethical guidelines, I had to handle two ethical considerations arising from my position as a CIP scientist and from the

action-research approach. As mentioned, because of my involvement in the design and implementation of the InnovAndes Project as a CIP scientist, some actors in ANDIBOL expressed their concern about the neutrality with which the research would be carried out and in the case of the CD-PIC and Local Platforms some actors expressed their concern regarding whether the research, beside of seeking scientific and academic purposes, would also serve their more practical interests. Opening spaces for critical reflection and discussion with the participants, allowing them to participate in the selection of instruments for data collection, communicating and exchanging information and monitoring participants' perceptions about the usefulness of the research throughout the action - research process, was crucial in facing the concerns that arose from my positions as a CIP scientist.

On the other hand, although an action-oriented approach was adopted, the action-research cycle was not totally completed in the sense that no practical solution or actions aimed at improving or transforming participants' practice were analysed and implemented, because the scope of this research's questions, my time constraints as part-time PhD student and other work demands as a CIP scientist. These restrictions were discussed with the participants at the beginning of the field work phase and we agreed on defining that this research would serve to create the knowledge basis on which the participants would improve their practices in the future.

3.7 Conclusions

On the basis of the discussion above, it can be concluded that the deductive-inductive-deductive logic and action-oriented nature of this qualitative research was suitable to foster an interactive (non-linear) and progressive process of construction of useful knowledge for both the researcher and the participants. The methodological approach discussed in this chapter addresses both the need to be flexible and interactive, and the need to have an organized and systematic approach to carryout action-oriented studies. In adopting this

research approach, I sought to contribute with practical insights into how forms of collaboration and coordination among heterogeneous actors are constructed, negotiated and re-negotiated in practice in terms of the development and operation of mechanisms for coordinating the interaction needed for agricultural innovation (Horton et al, 2009; Hall, 2007; Spielman, 2005). In this regard, it is argued that differently from other conceptual, descriptive and evaluative studies reported in the literature on innovation and collective action, this thesis constitutes a very detailed and nuanced study of innovation in action.

Common concerns and criticisms about the rigour of qualitative research were handled systematically throughout the research process, combining different strategies. Validity was approached within the interactive process of collecting, sharing and deepening information by using multiple sources of data and multiple instruments to collect it (methodological triangulation and data triangulation), and by creating open spaces for critical reflection and discussion with the participants that allowed comparing my views with those of the participants, looking for data reinforcing or contradicting other pieces of data, and looking for data that allowed explaining convergent and divergent views.

The use of a deductive – inductive – deductive logic for data collection and analysis was also suitable to address validity and also in pursuing theoretical generalization. This combined logic allowed the theoretical ideas of the conceptual framework discussed in Chapter 2 to be used for deductively defining themes to analyse patterns within the data and at the same time enabled the conceptual framing to be challenged systematically during the inductive processes used in the research. This process of challenging theory is in line with the process of discovering theory from data, referred to in the literature as the logic of grounded theory (Bowling 1997, p. 109).

The third common criticism about the rigour of qualitative research refers to reliability. Although each step of the interactive process of data collection and analysis through which this research proceeded was carefully documented, not only as a mean to achieve reliability

but also as part of the communication and information exchange strategy with the participants, it is argued that my personal position as a CIP scientist, the degree of my involvement with the cases, and my position as a part-time PhD student determined that I confronted particular conditions (risks and advantages) that probably other researchers would not encounter. Therefore the methodological measures that other researcher would need to address are likely to be different from the measures discussed in Section 3.5. However, I also argue that some methodological guidelines can be followed in researching similar cases using the research approach and process discussed in this chapter:

- Designing and conducting the research process as an interactive (non-linear) and progressive process of construction of useful knowledge for both the researcher and the participants
- Adopting different strategies to approach validity and theoretical generalization: such as data and methodological triangulation and fostering critical reflection and discussion with the participants.
- Adopting a combination of deductive an inductive logic for data collection and analysis
- Monitoring participants´ perceptions about the usefulness of the research
- Fostering communication and information exchange with the participants
- Keeping the research process flexible to allow the participants to be part of the selection of instruments for data gathering in correspondence with their preferences, time constraints, social and economic background.

A detailed discussion about the methodological contributions for the conduct of in-depth action-research case studies of ongoing collective action processes of institutional innovation is offered in Chapter 8.

Chapter 4 The context of Bolivian agriculture and case description

4.1 Introduction

This chapter offers an overview of the context of Bolivian agriculture, its constraints, and of the different approaches tried during the last three decades to organize an agricultural research and technology transfer system that meets the more pressing problems affecting agricultural production and the wide range of actors involved (Section 4.2). By discussing these issues, this chapter seeks to frame the context to which this research is of relevance and the scope of its contributions.

As explained in Chapter 1, agricultural innovation in Bolivia takes place in a complex context of diverse and changing agro-ecological, social and economic conditions and multiple and very often micro innovation agendas. This diversity challenges the approaches and initiatives aimed at strengthening the Bolivian system of innovation. In this account, it is argued (Section 4.3) that the evolution of the Bolivian public institutions supporting agricultural development in general and agricultural research and technology transfer in particular, their failures and successes, have to do with how the different approaches faced the challenge of articulating farmers, NGOs, public and private R&D organizations, market agents and other relevant actors within a system of innovation.

As outlined in Chapter 1, since 2001 the new Bolivian System of Agricultural, Livestock and Forestry Innovation receives the technical and financial support of a major World Bank project to strengthening the patterns of interaction across the whole range of actors involved in innovation and for developing mechanisms for coordinating the interactions needed for innovation. This is the context in which this research is of relevance (Section 4.4) and will contribute by studying in-depth two cases of R&D project driven process of formation and operation of multi-stakeholder platforms aimed at fostering pro-poor agricultural innovation (the cases are presented in Section 4.5).

4.2 Bolivian agricultural innovation context

4.2.1 Agriculture and poverty in Bolivia

With an estimated total population of 10 million (2011), 30% living with less than US$ 2 per day (2008), and a Gini coefficient of income distribution of about 0.6 (2008) and 10% of the population obtaining 40% of the national income, Bolivia is one of the poorest and most unequal countries in Latin America (IFAD, 2011; FAO, 2012a). Thirty-three percent of its total population lives in rural areas (2008) from which almost 78% is classified as poor (2007) and 85% of the rural inhabitants depends on farming for a living (41% of the Bolivian total population) (IFAD, 2011; FAO, 2012b). Bolivia´s main poverty and malnutrition indicators are presented in Table 4.1.

Since 2001, the 333 municipalities in which the country is divided are classified according to the index of vulnerability to food insecurity developed by the Bolivian government and the World Food Programme (Cuellar, 2002). The index combines the risk of people living in a particular municipality of entering into food insecurity with the capacity and opportunity they have to recover their previous position. For example, a high risk of losing food availability and access (because of natural events, poor soil fertility, low access to irrigation, for instance) and people´s low response capacities (for example, due to poor human and financial capital, and low access to markets, technology and other services) result in a high index of vulnerability. In 2007, 38% of the municipalities presented high and very high indices of vulnerability; all of them corresponded to rural municipalities (CIP, 2010).

Table 4.1 Bolivia's poverty and malnutrition indicators (percent)

	Indicator	Bolivia
POVERTY	Population under the poverty line	[2007]
	- At national level:	60.1
	- Urban areas:	50.9
	- Rural areas:	77.3
	Population under the extreme poverty line	[2007]
	- At national level:	26.1
	- Urban areas:	14.8
	- Rural areas:	48.1
MALNUTRITION	Child under 5 with chronic malnutrition	[2008]
	- At national level:	21.8
	- Urban areas:	17.2
	- Rural areas:	38.6
	Child under 5 with chronic malnutrition in the poorest 20%	[2008] 45.9

INE, 2008

Agriculture contributes roughly 10 % to GDP (2008). Approximately 75% (2011) of this contribution corresponds to non-industrial agricultural and livestock staple food (wheat, maize, rice, potatoes, bovine meat, plantains, poultry meat, milk, pig meat) produced by smallholders in less than 1 hectare of arable land per family, extremely poor access to irrigation (less than 4% of the cultivable land in total), low use of fertilizers (up to 6 kg. of nutrients per hectare of arable land in 2009), and low utilization of certified seed (for example, in 2010 less than 1.5 % of the production of potatoes was supplied with certified seed). This non-industrial agricultural and livestock production employs almost 75% (2009) of the rural labour force, and is mainly located in the Andean valleys and highlands (Altiplano) region and in the arid lowland region (Chaco region) of the country. Conversely, the dynamic, specialized, high-productive, and export-oriented agriculture (soybean, sunflower, cotton, sugarcane, forestry, exportable bovine meat) concentrated mostly in the tropical lowlands of Santa Cruz, employs less than 20% of the rural force (INE, 2013; IFAD; 2011; FAO, 2012a; INIAF, 2010a).

In spite of the importance of agriculture for the labour force, it receives a very low percentage of Bolivian public expenditure. In 2007, just 1.4 % of the total Bolivian public investment was destined to the agricultural sector, and 0.8 % to support agricultural research and technology transfer (FAO, 2012; INE, 2013). Apart from Paraguay, this level of public investment is lower than those registered in neighbouring countries.

4.2.2 Constraints on Bolivian Agricultural Development

Agricultural innovation in Bolivia faces some distinctive problems, particularly when innovation is oriented to the smallholder non-industrial agricultural and livestock staple food sub-sector. Hall et al (2007, p. 80), studying contrasting experiences of promoting small-scale irrigation technology in South Asia, explain this difficulty by highlighting four characteristics of agricultural production in developing countries: i) the high diversity and variation over time of the agro-ecological conditions in which agricultural production takes place; ii) the very large number of socially and economically diverse production units (smallholder) involved in agricultural production; iii) "much of the agricultural technology is highly sensitive to agro-ecological conditions, specially technology that is embodied in biological material (improved varieties, animal breeds)" (ibid, p. 81); and iv) normally, "the role of the public and the private sector in the innovation process is defined as mutually exclusive and independent of contexts" (ibid, p. 81) depending on whether agricultural technology is classified as a public (non-excludable and non-rival) or as a private good. Data about the Bolivian agricultural context in relation to the four points highlighted by Hall and colleagues is discussed below along with data about the approaches that have aimed to address the challenges that this particular and complex context poses to innovation.

Beside the diversity of the agro-ecological conditions (climate, soil type, pest and incidence of diseases and water availability for irrigation) in which agricultural production

takes place, the Bolivian agricultural sector is highly diverse in social and economic terms. According to official data (INIAF, 2010a) there are approximately 400,000 small productive units (equal number of smallholders) cultivating 1.5 million hectares from which almost 70% are collective (communitarian) properties while individual landholdings do not exceed 1 hectare of arable land per family on average. Additionally, depending on the availability of arable land, water for irrigation, labour force, financial resources, weather conditions, proximity to cities and markets, and access to services, the production strategies of small households range from production for self consumption exclusively, the sale of surplus after household consumption, to the production of some crops exclusively for the market.

Ethnic diversity is also important. There are about 40 officially recognized ethnic groups in Bolivia. However, most of the rural families engaged in agriculture and livestock production are Quechuas, Aymaras or Guaranies. Ethnic differences influence how, for what and under what circumstances farmers act individually or are collectively organized, for example, for resource management, production, marketing, access to services, or to influence local authorities and other actors. Official data recognizes the existence of 7000 communitarian social organizations grouping small households across the country, 760 of them legally established as Indigenous Peasant Economic Organizations (INIAF, 2010a).

This heterogeneous context translates (in the past and currently) into multiple and often micro-located innovation needs that are difficult to address by developing and promoting generic technologies based on the work of a centralized public research and technology transfer organization. This is in fact one of the reasons that explain the failures of the Bolivian public research and technology transfer system in driving agricultural technical change that positively impacts on the large number of poor farmers involved in the production of staple products during the period 1975 – 1991 (Piñeiro, 2009; Godoy et al, 1993).

The complexity of the Bolivian rural sector is compounded by the presence of a large number of NGOs which differ in terms of size, field of specialization, political and religious orientation, ways of thinking and working. During the seventies the number, coverage and diversity of topics in which the NGOs were involved grew considerably as a response to the poor presence of the state and public services in rural areas. One hundred twenty eight NGOs were reported operating in rural areas in 2007 (JICA, 2007) supporting poor rural people in agriculture, market access, organization, social participation and gender, natural resources management, health and education. Between 1991 and 1997 initial attempts to engage NGOs in technology transfer were made. However, no significant results were achieved partly because of poorly developed or lack of coordination and collaboration mechanisms between the public research sector and the NGOs (Montaño et al, 2007; Piñeiro, 2009).

More structural reforms were tried between 2001 and 2006 to improve the Bolivian system's capacities to deal with the diversity of agro-ecological, social and economic conditions of the Bolivian agricultural sector. The reforms were aimed at developing an efficient and competitive market of research and technology transfer services (based on the work of NGOs, private R&D organizations and other service providers) in which the role of the state was reduced to provide information services, allocate public funds within a model of free market bidding for the allocation of research and technology transfer projects, and to define and enforce the rules governing such a free market agricultural innovation system (Hartwich et al, 2007a; Bojanic, 2001). The results after 6 years of operation showed that a strategy that relies almost exclusively on the supply of private services, with no participation of the public sector in research and technology transfer, was not capable of reaching and benefiting poor, vulnerable and excluded farmers. This was partly because the private sector was poorly developed to compete in the bidding process, lacked capacities in research as well as in technology transfer, and was reluctant to take the

risk of working with poor farmers. Therefore, just few well developed R&D organizations operated actively within this system and only well organized farmer associations were reached and benefited (Gandarillas, 2009; Lema et al, 2006, Montaño et al, 2007).

The challenge of articulating farmers, NGOs, public and private R&D organizations, market agents and other service providers remains valid for the new Bolivian System of Agricultural, Livestock and Forestry Innovation, led by the National Institute for Innovation in Agriculture and Forestry since 2008. Spielman (2005, pp. 32-35) points out that this challenge must be approached from an innovation systems perspective considering the institutional context in which the process of social and technological change takes place, and recognizing the complexity of the relationships between heterogeneous actors with different norms, values and socio-economic backgrounds.

In the same vein, Hall (2007) notes that in a context of multiple and changing innovation demands for innovation typical of agriculture in developing countries, the patterns of interaction between heterogeneous actors are insufficient to support innovation on a continuous basis. This lack of interaction is a reflection of deep-rooted habits, practices and routines in both public and private organizations and a consequence of the absence of, or poorly developed mechanisms for, coordinating the interaction needed for innovation. In this account, Hall proposes two main recommendations to strengthen agricultural innovation in such complex conditions:

- "A major shift in interventions away from supporting agricultural research and with a new focus on strengthening patterns of interaction across the whole range of actors involved in innovation" (ibid, p. 14).

- "A priority within this new focus is to find ways of developing and adapting habits and practices that foster a capacity to innovate that integrates pro-poor and pro-market agendas" (ibid, p. 14).

The implications of the discussion so far for the new Bolivian system of agricultural innovation are discussed in the next section which outlines the evolution of the Bolivian public institutions supporting agricultural development in general and agricultural research and technology transfer in particular.

4.3 Evolution of the public institutions for agricultural innovation in Bolivia

The evolution of the Bolivian public institutions for agricultural innovation, as well as in other developing countries, is abundantly documented in the literature (Pineiro, 2009; Godoy et al, 1993; Hartwich et al, 2007a). The phenomenon has been explained from a diversity of perspectives ranging from economic, political, technical, and from the perspective of the prevailing model of thinking about agricultural research and development. The role of the state in economic activity in general, and in innovation in particular, is central to any model of innovation and therefore in any approach on how to structure the institutions for innovation. As is shown below, the evolution of institutions for agricultural innovation in Bolivia has been strongly marked by shifts in the policies that define the role of the state, the participation of the public and private sectors, and changes in the structure of governance, whether centralized or decentralized.

This section covers three periods of the history of the agricultural innovation in Bolivia. In summary, these periods are as follows:

- The first period from 1975 to 1997 was led by the Bolivian Institute for Agriculture and Livestock Technology (IBTA) based on the research and extension model promoted since 1952 by the Inter-American Agricultural Service supported by the United States Government. The model relied on the investment of public funds through a semi-autonomous state institution, where the researchers working in experimental stations developed new technologies and extensionists had the role of delivering them to the farmers (Bojanic, 2001; Godoy, 1993).

- In line with its commitments to the International Monetary Fund and the World Bank, in the mid-1990s Bolivia experienced a range of economic and administrative structural reforms mainly aimed at reducing its huge fiscal deficit and foreign debt. As in other countries in the region, the role of the state in the economy was reduced, many public services and state enterprises were privatized, and economic policies were re-oriented within a free market model (Montaño et al, 2007). These reforms drove the closure of the Bolivian agricultural research and extension system described above and gave rise to the emergence of a new system – the second period - based on a competitive market of private research and technology transfer services. This model operated between 2001 and 2007 (the second period discussed in this section) based on the notion that free market competition would increase the efficiency and quality of research and technology transfer services and raise the productivity and competitiveness of agricultural production in domestic and foreign markets, thus impacting positively on poverty reduction in a context of market globalization and liberalization of the economy (Montaño et al, 2007; Hartwich et al, 2007a; Gandarillas, 2009).

- The third period started in 2008 when the current Bolivian government abolished the free market innovation system described above. Arguing that the free market economic policies applied during the last 20 years had excluded and impoverished the poorest sectors of the country and that they had been unable to achieve significant impacts on poverty reduction, the government launched a series of measures to restore the control and participation of the state in various fields of the economy, including agricultural research and technology transfer (Sanjines, 2006; Montaño et al, 2007). The National Institute for Innovation in Agriculture and Forestry (INIAF) was established as a leading organization of the Bolivian National System of Agricultural, Livestock and Forestry Innovation. The new

system emphasizes the responsibility of the state in the provision of essential public goods and its leading role in articulating the wide range of public and private actors involved in agricultural innovation, ensuring the effective integration and participation of poor farmers in the innovation processes (INIAF 2010a, 2010b; World Bank, 2011).

These periods are now reviewed in more detail.

From 1975 to 1997: agricultural research and technology transfer based on a single governmental organization.

In 1975 the Bolivian Government established the Bolivian Institute for Agriculture and Livestock Technology (IBTA) as a decentralized institution of the Ministry of Agriculture. As other national agricultural research institutes in Latin America, IBTA was created to take charge of the research and extension of technology under the linear model of technological development prevailing at that time (Bojanic, 2001; Godoy, 1993). Under this model, the technology developed by the international research centres was transferred to national research institutions for adaptation and validation under local conditions. Once validated, the technology passed into the hands of extension agents with the mission to spread it among the end users (Bojanic, 2001; Gandarillas, 2009; Montaño et al 2007). The IBTA's structure comprised a centralized unit of technical and administrative direction (in La Paz) and research stations located in different ecological zones across the country. Each station had the mandate to carry out research on staple products and to solve the more pressing technical constraints affecting crop yield and production.

With this approach and with the financial support from the Inter-American Development Bank (BID), the World Bank and the Swiss Agency for Development and Cooperation, IBTA functioned from 1976 to 1998. During this period many assessments were carried out and reforms were intended (mainly commissioned by the IBTA´s financial supporters)

in order to overcome the problems and failures of the IBTA in driving agricultural technical change that positively impact the large number of poor farmers involved in the production of staple products.

In 1989 a diagnostic mission of the International Service for National Agricultural Research observed that IBTA's leadership suffered from strong political influence and high administrative centralization and bureaucracy, undermining its autonomous nature, causing frequent changes in its directive, administrative and technical staff, and reducing its overall efficiency (Godoy, 1993; Montaño et al, 2007). While significant progress was achieved within the IBTA´s experimental stations through basic research on varietal breeding, soil fertility and management, pest and disease control, establishment of gene banks, and quality seed production (Godoy, 1993), much less progress was achieved in disseminating and diffusing these research results, putting them into the hands of users and achieving high adoption rates (Bojanic, 2001). In addition to the political and administrative reasons discussed above, this gap resulted from the IBTA´s lack of technical capacity, practices and routines, budgeting pressures, and weaknesses in coordinating and collaborating in the massive spread of technology with the more than 170 NGOs and 100 private firms providing technical assistance and other services in rural areas across the country at that time (Montaño et al, 2007; Piñeiro, 2009).

In 1991, the Ministry of Agriculture and the World Bank launched an ambitious US$ 21 million programme aimed at restructuring the IBTA (Godoy, 1993; Bojanic, 2001). As part of the reforms, research was concentrated in six prioritized crops and the scope was reduced to six experimental stations with a limited geographical area of influence. The IBTA's extension services were closed and a new transfer model was proposed based on intermediate users, mainly NGOs operating in the field (Bojanic, 2001). Intermediate users would be in charge of the massive spread of technology, while IBTA would provide

technical support to those organizations and would be responsible for carrying out research activities through decentralized research stations (Montano et al, 2007; Pineiro, 2009).

However, this new research and transfer model was never fully implemented because the persistent problems of political interference in the IBTA´s administrative and technical leadership and due to the declining allocation of public funds to its operation. When the World Bank financial support finally ended, the IBTA was formally closed in 1997 (Bojanic, 200; Montano et al, 2007; Pineiro, 2009).

From 2001 to 2007: agricultural innovation based on the development of an efficient and competitive market of research and technology transfer services.

With the closure of the IBTA in 1997, Bolivia was deprived of a national agricultural research and technology transfer system. To fill this gap, in 2001 the Bolivian government through the Ministry of Agriculture, Livestock and Rural Development enacted a supreme decree creating the Bolivian Agricultural and Livestock Technology System (SIBTA) with US$ 30 million from the financial support of the Inter-American Development Bank (Bojanic, 2001; Gandarillas 2009; Decreto Supremo. Bolivia. Presidencia de la República, 2000). The new system was born as a state policy to support the agricultural sector in line with the economic and administrative structural reforms of the Bolivian state initiated in the mid-nineties. These reforms were aimed at reducing the fiscal deficit, reducing public sector involvement in economic activities, decentralizing the administration of the state, strengthening private sector role in the economy and promoting the productivity and competitiveness of the national production in the international markets.

Two national laws stand out as central in this regard: the Popular Participation Law enacted in 1994, and the Administrative Decentralization Law in 1995 (Montaño et al, 2007; Bojanic, 2001, Gandarillas, 2009). Both laws transferred decision-making power to regional and local governments to allocate public resources in health, education and

productive activities. They also established formal mechanisms that broadened the participation of social organizations and other governmental and non-governmental organizations in planning processes, decisions making and control over the correct use of public resources (Ley de Participación Popular. Honorable Congreso Nacional, 1994)

The new system embraced as a cornerstone of its design the development of an efficient and competitive market of research and technology transfer services, focussed on agricultural products prioritized by the government as having export potential. This central goal was based in turn on the following assumptions: research and technology transfer had to be demand-driven, and the end users (producers) must be willing to pay for them. This assumed i) the existence of well-organised demand and the ability to express it within a competitive framework: ii) that there were sufficient capacities among private actors (NGOs, private research and development organizations and private firms) to offer research and technology transfer services and that they were willing and capable to act within a model of free market process (bidding) for the allocation of projects; and iii) that there was a considerable amount of knowledge and technology in the hands of the research and technology transfer organizations which only needed to be adjusted to be transferred to the end users (Gandarillas, 2009; Montano et al, 2007; Hartwich et al, 2007a).

To operate the SIBTA, four Foundations for the Development of Agricultural and Livestock Technology (FDTA) were created, one for each of Bolivia's main agro-ecological regions: the highlands, valleys, tropical and semi-arid region (Bojanic, 2001; Hartwich et al, 2007). Two or three times a year, each FDTA launched competitive calls for Innovation Projects for Applied Technology (PITAs) in which end users were expected to demand technologies based on the principle of free market mechanism (bidding), and the research and technology transfer service providers were expected to compete in the bidding process in response to the end users' demands (SIBTA, 2003).

The above strategy was implemented for almost six years. An external impact assessment carried out in 2006 (Lema et al, 2006) reports important achievements in terms of activities and outreach, but also significant problems that limited SIBTA's achievements in terms of impacts. In 5 years of working, 264 PITAs were financed reaching about 84,000 rural families (ibid, p. 3) with the participation of almost 230 producer organizations and 135 service providers (ibid, p. 4), and almost US$ 30 million were invested (Gandarillas, 2006, p. 17). The evaluation (Lema et al, 2006, p. 11) also reports that about 80% of the users expressed that they were satisfied with the results of PITAs in which they were involved, 79% mentioned increases in their income levels, 80% were satisfied with the services provided, and 69% reported improvements in their technical capabilities. Conversely, 62% manifested that the demands were induced by the providers, 66% considered users' participation in the design of PITAs was weak, and 40% expressed that PITAs' benefits did not reach vulnerable and excluded groups (ibid, p. 12).

In evaluating the performance of the SIBTA, Gandarillas (2006) points out a number of difficulties that challenge the main assumptions on which the creation and operation of the system was based. Gandarillas notes the following:

- "The process of launching a PITA was very bureaucratic, so responses to end users' demands tended to be out-dated" (ibid, p. 17).

- "Only a small number of agricultural research projects had been delivered (5) as compared with a large number (264) of applied projects (PITAs)" (ibid, p. 17). Therefore, poor progress was achieved in generating new technologies.

- Because PITAs allocated resources in agricultural chains with export potential, producers often demanded technologies that were not available locally. Only few R&D service providers with research capabilities were able to address these demands (ibid, p. 17).

- In addition to the previous point, the competitiveness among R&D service providers was relatively weak. There were few R&D service providers capable of meeting the financial and logistical requirements of the PITAs. This was compounded by the fact that the PITAs´ regulations did not provide incentives for smaller organizations to participate in the bidding process.

- The FDTAs tended to work with farmers who were well organized, and who grew export crops, which meant that poor farmers were usually excluded (ibid, p. 18).

In 2006 a new government was democratically elected in Bolivia under the President Evo Morales Ayma. The new government launched the National Development Plan: "Bolivia Dignified, Sovereign, Democratic and Productive, to Live Well", which introduced profound changes in the structural aspects of the economic, social, political, and prevailing cultural context in the country (Ministerio de Planificación y Desarrollo del Estado Plurinacional del Bolivia, 2006).

In the productive sphere the political orientation provided by the National Development Plan involves a shift from a development model characterized by exploitation and export of natural resources with no value added, in which the control over the resources and investment relies on international and national private initiatives with scarce or even no participation of the state, to one that privileges state participation as a central actor in fostering a process of industrialization oriented to the generation, control and distribution of the economic surplus of the exploitation of renewable and non renewable resources (Sanjines, 2006; Montaño et al, 2007).

The National Development Plan explicitly recognized innovation and technical development as determinant factors in productivity and competitiveness, especially in sectors that generate income and employment, which are precisely those in which most of the population with lower income, is involved. Consequently, research and technical

transfer services have to be under the control of the state to ensure that disadvantaged and traditionally excluded sectors have access to and benefit from them. Accordingly the new government decided to abolish the SIBTA in 2007 arguing that agricultural research and technological transfer services on the hands of the private sector (the FDTAs) did not reach many of the rural poor, did not correspond with the new political orientations and did not allow the state to take charge of its public responsibilities (World Bank, 2011; Montaño et al, 2007).

From 2008 to date: the new Bolivian System of Agricultural, Livestock and Forestry Innovation

Since 2008, and with the abolishment of SIBTA, the Bolivian Ministry of Rural Development, Agriculture and Environment has embarked on the development of the Bolivian National System of Agricultural, Livestock and Forestry Innovation (SNIAF) under the leadership and control of the Ministry (Presidencia del Estado Plurinacional de Bolivia, 2008). The system recognizes and accepts the responsibilities of the state for the provision of essential public goods, such as basic long term research, maintenance of genetic diversity, and technical assistance to small farmers (Word Bank, 2011). The system also emphasizes the role of farmers, indigenous communities, social organizations, universities and other academic actors, private firms and of local governments, and the need for and value of articulating the efforts of all these actors for innovation.

To lead the SNIAF, the National Institute for Innovation in Agriculture and Forestry (INIAF) was established in June 2008 by Supreme Decree No. 29611. INIAF is a decentralized public institution, with administrative, legal, financial, and technical autonomy, under the tutelage of the Ministry (Presidencia del Estado Plurinacional de Bolivia, 2008; INIAF 2010a; 2010b). Under the decree, INIAF is the leader of the SNIAF. It has the roles of generating technologies, setting guidelines and managing public policies

for agricultural, livestock and forestry innovation to contribute to food security and food sovereignty. This is to be carried out in a framework of social participation and the management of genetic resources from agro-biodiversity as state property.

In accordance with this, INIAF has been assigned with the following functions (Presidencia del Estado Plurinacional de Bolivia, 2008):

- Guiding and implementing research and technical assistance processes, supporting seed production, recovering and diffusing traditional and scientific knowledge, technology development and diffusion, and genetic resources conservation and use.

- Regulating and supervising all public and private agricultural research and technology transfer activities.

- Articulating and coordinating the work of all the social and institutional actors involved in agricultural innovation at national, sub-national and local levels.

- Providing seed certification services and variety and plant breeder registration, and other services in the field of agricultural and seed research.

Both, the work of INIAF and of the SNIAF have to be in tune with and obey the regulations contained in the Law of Autonomy and Decentralization issued on July 2010 and in the law of the Productive and Communitarian Agricultural Revolution launched in 2011 (Ley Marco de Autonomías y Descentralización "Andréz Ibañez". Honorable Asamblea Plurinacional, 2010; Ley de Revolución Productiva Comunitaria Agropecuaria. Honorable Asamblea Plurinacional, 2011). The first law provides the new basis for decentralization in Bolivia and the second regulates the role of the state and other public and private actors in agricultural production, rural development and agricultural research and technology transfer.

It took INIAF almost two years to begin its operations. During the process, a Strategic Plan was formulated including the main fields of intervention, the role of INIAF in each field, and the network of other actors with which the implementation of the plan would be articulated (INIAF, 2010b). Many international agencies have agreed to support INIAF development and the operation of its strategic plan. For example, the World Bank signed (August 2011) an agreement with the Bolivian Government for credit for US$ 39 million aiming to strengthen INIAF's capabilities to guide and articulate the national system of agricultural innovation (SNIAF), agricultural research and technology transfer, and seed certification and distribution (INIAF 2010a, World Bank, 2011). This project (named Innovation Programme for Agricultural and Livestock Services, or PISA) has as one of its goals helping INIAF in leading the formation and operation of departmental and local networks for pro-poor agricultural innovation across the country, otherwise known as Departmental and Local Committees of Agricultural Innovation (World Bank, 2011).

4.4. Relevance of this research to the new Bolivian system of agricultural innovation

At the point of writing, it is too early to evaluate the operation of the system established since 2008 and the World Bank project of 2011. However, some aspects of its design stand out in relation to the challenges for agricultural innovation discussed in Section 4.2. The World Bank project appears as a project-driven public effort aimed at strengthening the patterns of interaction across the whole range of actors involved in innovation and developing mechanisms for coordinating the interaction needed for innovation. In tune with the literature on institutions and institutional analysis discussed in Chapter 2, this public effort can be understood as a process that seeks the development of a new form of multi-organizational collaboration conducive to agricultural innovation which implicitly encompasses a process of institutional innovation in terms of the development and enforcement of operational rules that enable networks' members to act collectively.

In addition, many elements of the new system's design are in line with the innovation systems perspective and collective action theoretical insights discussed in Chapter 2. First, it recognizes that agricultural innovation (specifically research and technology transfer) is a process that involves networks of actors including farmers, public and private R&D organizations, firms and other service providers among others; second, it recognizes sub-systems of innovation at departmental and local levels; and third, it defines the existence of a system leading/ facilitating/articulating agent (the INIAF in this case).

These comments frame the relevance of this investigation to the current context of agricultural innovation in Bolivia. Because the implementation of the PISA began in late 2011, its conceptual and practical development is still incipient and can be informed by learning from the experience of similar initiatives in operation in Bolivia since before INIAF's enactment. By studying in-depth two cases of R&D project driven processes of formation and operation of multi-stakeholder platforms aimed at fostering pro-poor agricultural innovation in Bolivia, and considering that R&D projects are and will be one of the most important instruments in which to invest public funds to strengthen agricultural innovation, this research contributes theoretical and empirical insights in relation to the three major concerns outlined earlier in the thesis. In sum, they are: i) the factors influencing the extent to which and with what effects R&D projects act as drivers of institutional innovation; ii) the factors influencing the role of facilitation of institutional innovation processes when these processes are R&D project driven; and iii) the implications of the previous two points for the design and operation of R&D projects used to drive institutional innovation processes aimed at strengthening agricultural innovation, as it is the case of the PISA project.

As discussed in Chapter 3, the two cases studied in this research were selected because both correspond to R&D project driven experiences currently in progress in Bolivia, in which multiple players with multiple attributes are involved to develop mechanisms that

enable them to act collectively in fostering innovation. Both cases are presented in more detail below.

4.5 Case description

4.5.1 Case 1: building multi-stakeholder platforms to foster pro-poor market driven innovation – from the Papa Andina Model to ANDIBOL

As outlined in Chapter 3, the model was developed and promoted by the Papa Andina Initiative, a partnership programme hosted by the International Potato Centre. The model promotes multi-stakeholder platforms as an approach to foster interaction, social learning, social capital formation, and collective activities involving diverse actors in innovation processes, bringing farmers' associations together with traders, processors, researchers, extension agents, service providers and others to foster market driven pro-poor innovation (Devaux, et al, 2009).

Multi-stakeholder platforms have been promoted by the Papa Andina Initiative as part of a set of approaches developed to foster pro-poor innovation in value chains in which poor farmers of the Andean region are involved. Such farmers have the potential to benefit from market opportunities by using and improving their natural and physical resources, local knowledge, and social capital. As noted by Meinzen – Dick et al (2009), the Papa Andina Model of multi-stakeholder platforms emphasizes the importance of collective action among farmers and interactions with market agents, research organizations and other service providers to foster innovation and to access and build market opportunities that benefit farmers and other actors in the market chain.

According to this, and in line with the notion that the process of innovation involves the interaction between different actors engaged in the production, diffusion and use of knowledge with social and economic ends, the Papa Andina Initiative promotes multi-stakeholder platforms following the definition provided by Thiele et al (2011, p. 3): "as a

space of interaction among different stakeholders who share a common resource to improve mutual understanding, create trust, learn, reach consensus over priorities, define roles and engage in joint action".

According to Critchley et al. (2006), the stakeholders are all actors who have an interest in the production and consumption of agricultural products. These include farmers, researchers, extension workers, educationalists, government policymakers and business people from the private sector. Partners are those actors who jointly plan and implement activities. In order to collaborate, these partners mobilise and share resources and agree on how these will be managed. Finally, the platform is the space where partners dialogue, make decisions and agreements.

In accordance with the purpose of Papa Andina Initiative of fostering market oriented pro-poor innovation, the establishment and operation of multi-stakeholder platforms was promoted to play two main and inter-connected functions:

1. To improve coordination and governance in the market chain, and;

2. To stimulate joint innovation and formulate demand for research.

By performing the market chain coordination function, a multi-stakeholder platform contributes (or it is expected to contribute) to reducing transaction costs that arise in circumstances where market chain actors lack access to information about goods, services and the parties involved in an exchange, and have difficulties in developing and enforcing exchange agreements (Dorward et al, 2009). From a practical viewpoint, multi-stakeholder platforms are expected to be used to address market coordination problems by connecting otherwise unconnected actors, articulating the demand for products and services with their corresponding supply, and serving as a space where actors agree the terms (price, quality, volume and timeliness standards) of their commercial relationships.

Closely related to the first function, the second is intended to permit the articulation of actors´ innovation needs, facilitate the linkages between relevant actors for innovation, bringing together R&D organizations, NGOs and other supporting organizations to provide technical and other types of support, and to manage the process of innovation to solve the constraints faced by actors in exploiting market opportunities (Thiele et al; 2011).

This conceptual background inspired and gave rise to the design of the InnovAndes project, a research and development project implemented by a R&D organization and a local NGO. The project came into operation on 2007, and it was envisaged that it would serve to validate the multi-stakeholder platform model promoted by the Papa Andina Initiative and adjust it to local conditions. As such, the project design included some general guidelines regarding the formation and operation of the platform.

The InnovAndes project design included two main components. The first component was directed to support the formation and operation of a multi-stakeholder platform as a space for bringing farmers together with markets agents and other supporting organizations to foster pro commercial and technological pro-poor innovation. The second component was aimed at increasing poor farmers' access to improved technologies that allow them to overcome production constraints, and to strengthen their organizational capacities to participate in equitable conditions with other market agents inside the platform to exploit new market opportunities.

Regarding the first component, the project design established that the initial composition of the platform should include the participation of the farmers' organizations, the firms, the R&D organization and the NGOs that had been part of a previous collaborative project developed by the Papa Andina Initiative. In the InnovAndes project design, the project implementing R&D organization was also assigned the responsibility of leading and facilitating the formation and operation of the platform.

According to the project design, the implementation of the second component was a shared responsibility between the two project implementing partners: the R&D organization and the local NGO. The former would act as advisor in participatory methods of research and technology transfers, agricultural research service provider, and as advisor in technological issues related to the production of potatoes and Andean grains. The local NGO would be in charge of the implementation of technology transfer activities as well as of activities to strengthen the organizational capacities of the farmer organization to participate in research and technology transfer activities and in developing and benefiting from market opportunities.

The project situated the farmers and their organization at the centre of both components. According to the project design, market signals and the development of new businesses should guide agricultural research, technology transfer and the provision of other services to increase farmers' income levels. According to the project design, farmers' income can be increased by enhancing their capabilities of using the natural and physical resources, local knowledge, and social capital they have, through improvements in their access to new technologies and markets (International Potato Center, 2006, p.38). In this sense farmers' linkages and interactions with other market chain actors and services providers were considered as crucial for innovation to be responsive to the farmers. Thus, the platform should be the space where these linkages and interactions take place.

Finally, although the project design did not explicitly define the status (partners, allies or beneficiaries) of other market chain actors within the platform, it was expected that they would act as buyers of products, and they would contribute in opening new business opportunities for farmers' products, and providing market information. At the same time, it was expected that other market chain actors would benefit from the platform by reducing the transaction costs they face in searching and contacting trustworthy providers.

One such platform was the Bolivian Andean Platform (ANDIBOL). Earlier efforts to build ANDIBOL started in 2003. At this time the Papa Andina Initiative in alliance with a R&D organization in Bolivia (which later was the same R&D organization implementing the InnovAndes project) used the Participatory Market Chain Approach to foster innovation in the market chains for "chuño": a traditional freeze dried potato products. The Participatory Market Chain Approach (PMCA) aims to identify and exploit new business opportunities that benefit the poor by stimulating market driven innovation of different types. It engages market chain actors, researchers, and other service providers in identifying and analyzing potential business opportunities (Bernet et al, 2006).

These activities involved farmers, traders, food-processing firms, exporters, cooking schools and R&D organizations. In the first cycle, participants prepared a set of Bolivian quality standards for chuño. In 2004, the PMCA was used again to identify new market opportunities for chuño, and ways to improve the product's image in different markets from the traditional ones. This exercise involved some participants from the first cycle and included chefs and a food-processing firm manager. It resulted in a new product: clean, selected and bagged chuño, marketed under the brand 'Chuñosa' (Devaux, et al, 2009. p. 35). In 2007, the InnovAndes project came into life and the formation and operation of ANDIBOL started.

The initial composition of ANDIBOL was based on the actors that had been part of the previous implementations of the PMCA. Table 3.2 details the composition of the platform. No new members have been involved since its formation, and all the members listed in the table were active at the moment of gathering the data for this research.

The formal objectives and functions of ANDIBOL are outlined in the ANDIBOL strategic plan for the period 2007 – 2010 (Plataforma Andina Boliviana, 2007). The document also provides an account of how, in 2007, ANDIBOL's members decided to carry out a

participatory process of reflection and strategic planning in order to guide the operation of the platform for the next three years. This was the first attempt to formalize (clarify and put in writing) ANDIBOL's mission, vision and strategic objectives.

Table 4.2 ANDIBOL's composition and members' roles[3]

Type of member	Role within ANDIBOL
One private R&D organization. Represented by the manager of the InnovAndes project within the R&D organization	– Platform facilitator and research and extension services provider.
One local NGO with experience in supporting organizational and technical capabilities of farmers Represented by the manager of the InnovAndes project within the NGO	– Accompanying, advising and supporting farmer organizations' representatives in participating within the platform. Provider of technology transfer services.
One international foundation working on building entrepreneurial capacities among farmers and medium scale firms Represented by a representative of the foundation	– Strengthening farmers' and firms' capabilities to develop business.
One farmers' organization formed by 290 families of potatoes and Andean grain producers. Represented by the president and vice president of the organization	– Selling Andean products in response to participating firms' demands for products.
Three medium scale firms, processing and selling Andean products in urban markets Represented by the owner of each firm	– Buying products from farmers participating in the platform. – Cooperating with farmers through their engagement and commitment in developing social responsible businesses. – Providing market information
One company specializing in foreign trade logistics. Represented by the owner of the company	– Providing information on market opportunities in other countries

The process started with the identification of strengths, weaknesses, opportunities and threats (SWOT) faced by ANDIBOL in function of the members' previous experiences as participants in the application of the PMCA. Almost all the results of the analysis related to the development of businesses between farmers and firms, involving the participation of service providers and supporting organizations. Consequently the facilitation of business development appeared as the central element of the objective of ANDIBOL:

[3] ANDIBOL members' different interests and views about their roles and about the functions of the platform are discussed in Chapter 5.

"The Bolivian Andean Platform exists to promote and facilitate the realization of socially responsible businesses based on Andean products between small farmers, medium scale processors and traders" (Plataforma Andina Boliviana, 2007, p. 14)

In order to promote and facilitate the realization of socially responsible business, the platform was to identify, bring together and facilitate the interaction between providers and buyers of products, as well as to identify and facilitate the interaction with supporting organizations and service providers with the capacity to respond farmers and firms' innovation needs. These included improvements in market access or product design, technologies to improve food processing and packaging, and to increase yields and improve the quality of production in farmers' fields.

In this sense, according to the strategic plan, ANDIBOL members agreed that the operation of the platform should be organized around the following strategic lines of action (Plataforma Andina Boliviana, 2007, p. 12):

1. Business development and management: articulating the demand for and supply of products and the provision of services to improve entrepreneurial skills of farmer organizations and firms in business planning and management, searching new markets, developing new products, marketing and promotion of products, and accessing financial support.

2. Technological innovation: articulating firms and farmers' technological innovation needs and the provision of services to improve their production and transformation processes.

The features of the Papa Andina Model, the InnovAndes Project and ANDIBOL outlined above, were the data used in the "approaching the case stage" of the research process (Chapter 3) to explore the extent to which ANDIBOL came to life in correspondence with the guidelines offered by the Papa Andina Model and the InnovAndes Projects design.

4.5.2 Case 2: building multi-stakeholder platforms to foster poor - farmers' needs driven innovation – from the Continuous Innovation Model to CD-PIC and Local Platforms

In 2007 the Swiss Agency for Development and Cooperation in Bolivia (COSUDE) proposed the Continuous Innovation Model as a new form of multi-organizational collaboration in the Bolivian agricultural context. The model was to help strengthen the Bolivian System of Agricultural Innovation in its purpose of improving farmers' productivity, competitiveness and food security through the integration of agricultural research, technology transfer and markets. Different from the Papa Andina Model which adopts market opportunities as driver for pro-poor innovation, poor-farmer needs are the innovation drivers in the Continuous Innovation Model.

Organizational documentation (COSUDE, 2009, pp. 26-25) provides a formal outline of the model, which relies on the following conceptual principles regarding agricultural innovation, research and technology transfer:

Impact orientation of agricultural innovation: According to this principle research and technology transfer results are not considered as impacts on their own, but as a means to contribute to improving poor farmers' life conditions and reduce poverty. In this sense, the use of new technology has to translate into increases in income, productivity and competitiveness; reduction of food insecurity; and better use and conservation of natural resources.

Agricultural Innovation as a continuous process: This principle underlines that the processes of innovation does not end with the release and diffusion of a particular technology in response to a particular need. The changing nature of the social, productive and market context in which farmers and other actors operate leads to new constraints and opportunities that need to be addressed.

Innovation as a context specific process: Linked to the previous principle, this principle recognizes that, although there are common problems and opportunities in different contexts, the way to address them through research and technology transfer relies strongly on the stock of local knowledge and capacities.

Agricultural innovation as a "Bottom – up" process: The model recognizes poor farmers' needs and their satisfaction as a trigger for innovation and situates poor farmers' participation at the centre of the decision making process associated with agricultural research and technology transfer.

Agricultural Innovation as a multi-actor process: According to this principle, the process of innovation involves the interaction of a broad range of actors including farmers, public and private R&D organization, academic sector, local governments, and firms.

Articulation of local innovation processes with development priorities of a larger context: This principle recognizes that innovation processes at the local level are nested in or influenced by a broader context defined by departmental policies and development priorities.

Based on these conceptual principles, the model proposes the formation and operation of multi-stakeholder platforms at local and departmental levels as multi-organizational forms of collaboration between private and public actors relevant for agricultural innovation. The formation and operation of local platforms is promoted around specific crops of relevance to a specific agro-ecological area within the department. This means that potentially more than one local platform can operate within a department. Each local platform potentially involves farmer organizations, local governments (municipalities), R&D organizations and other service providers, whether public or private providers, acting in a specific agro-ecological area.

Local platforms are expected to be the space where farmers and other local actors participate in the decision making process regarding agricultural research and technology transfer. In this sense, local actors organized around multi-stakeholder platforms identify, prioritize, and express their needs; and monitor and assess the extent to which research and technology transfer services satisfy them.

At department level, the model proposes the formation and operation of a single platform including the participation of representatives of public and private universities, representatives of the departmental government or of governmental development agencies, public and private R&D organizations, chambers of private entrepreneurs, unions or associations of agricultural producers, among others. According to the model, the multi-stakeholder platform at departmental level should serve as a space in which actors reflect and take strategic decisions on the alignment of local research and technology transfer efforts with departmental priorities, and simultaneously contribute in setting those priorities and policies.

The model recognizes that the response to poor farmers' needs arises from the articulation between demanders and providers of research and technology transfer services. In this sense, the model proposes the departmental platform as a network of actors that take advantage and use multiple sources of knowledge, capabilities and other resources to take decisions on the best way of responding poor farmers' technological needs.

This conceptual background gave rise to the design of the Continuous Innovation Programme, a research and development project founded by COSUDE with the intention of adapting the Continuous Innovation Model to local conditions. The programme came into operation in a first 'pilot' phase, running from January 2008 to June 2009, coordinated and implemented by COSUDE in partnership with a private R&D organization (COSUDE, 2009, pp. 4-6). The pilot phase focused on the formation and operation of two local

platforms: the Native Potatoes Local Platform in the high land region of the department of Cochabamba, and the Peach Local Platform in the valley region of Cochabamba. The programme initiated research projects in response to the needs of the farmers' organizations participating in both local platforms (Paniagua et al, 2010, p. 1).

After the pilot phase, a three year second phase of implementation started, in July 2009. The following is an account of how this second phase was intended to operate (COSUDE, 2009, pp. 20-24).

The second phase was aimed at strengthening the two local platforms and continuing the research project initiated during the first phase. In addition, it incorporated the formation and operation of a multi-stakeholder platform at departmental level.

According to the Continuous Innovation Programme design, it was expected that within a local platform the participating actors would identify and prioritize needs for technology based on an analysis of the productive and market constraints and opportunities they faced. These demands were to be translated into what the model denominates research and/or technology transfer 'mandates' depending on whether the attention of a particular need requires the development or adaptation of a technology or, instead, the diffusion of an existing technology.

These mandates are to be received and analysed by the members of the departmental platform in terms of its correspondence with the objectives and scope of the Continuous Innovation Programme and with departmental development priorities. Once analysed, the mandates should be converted into terms of reference to recruit specialized organizations for the provision of research and technology transfer services within a competitive bidding process of project allocation. It was assumed that this competitive process would ensure the quality of the services offered to farmers.

On the basis of the terms of reference, specialized service providers were to present project proposals to the departmental platform for revision, approval and allocation. According to the model, this process was to be undertaken simultaneously at departmental and local levels to take into account, from the beginning, the point of view of the local actors in the allocation decision.

According to the Continuous Innovation Programme design, during the implementation of projects, local actors organized through the local platform would take active part in monitoring and assessing project activities and their results. Monitoring and evaluation were to be guided by technical criteria in accordance with the plan of milestones and indicators of the project, and also by local criteria of satisfaction about the quality and relevance of the services provided through the project. The results derived from the monitoring and evaluation at local level were then to be analysed by the departmental platform and lead to changes and adjustments in the way in which the projects are implemented and also in the plan of milestones and indicators originally approved.

Finally, the continuity of the innovation process was to be ensured by the repetition of the cycle that begins with the identification of needs and opportunities and ends with the evaluation of the results generated by the projects. It was assumed that this could happen by strengthening actors' capabilities to continuously interact and innovate within both local and departmental platforms.

To support the operation of local and departmental platforms and the articulation between both levels, the programme included the presence of a technical team with the responsibility to facilitate the implementation of the programme at local and departmental level. Working at local level, this team should be in charge of encouraging local actor articulation and interaction, and strengthening local capacities to manage research and technology transfer projects. This includes the development of skills in the use of

participatory tools to identify and prioritize technological needs, planning, monitoring and evaluating projects.

The technical team was also expected to assist local platforms in its internal management, by helping actors in defining constitutive issues (rules, roles, structure, and working procedures) and facilitating their relations with other organizations, including their relations with the departmental platform.

At departmental level the technical team had the mission of encouraging actors to participate and interact within the departmental platform and to facilitate the definition of its constitutive aspects. By providing information, facilitating relationships with relevant organizations in the environment, and organizing forums for discussion, the technical team was expected to contribute to the departmental platform in articulating local research and technology transfer efforts with departmental development priorities.

To implement this second phase of the Continuous Innovation Programme, in 2009 COSUDE and the Departmental Council of Competitiveness of Cochabamba (CDC, for its Spanish acronym) signed an agreement for the council to take over the technical and administrative management of the programme (CDC-PIC, 2009), p. 1; Paniagua et al, 2010, p.2). The CDC is a non profit civil society organization that seeks to promote organizational coordination and collaboration to improve productivity and competitiveness in a variety of economic activities in the department of Cochabamba. It involves the participation of representatives from a variety of organizations including departmental and local governments, private sector associations, public and private universities, and research and development organizations whether public or private (ibid, p. 2).

Assuming the responsibility for the technical and administrative management of the programme, the CDC decided to form a specific committee dealing with research and technology transfer for the agricultural sector. This committee corresponded to the

departmental platform proposed by the Continuous Innovation Model and it was called the Steering Committee of the Continuous Innovation Programme in Cochabamba (the CD-PIC, for its Spanish acronym).

The CD-PIC was officially formed in 2009, initially involving the participation of the CDC member organizations which had a close relationship with the agricultural sector in Cochabamba. Table 4.3 shows the initial composition of the CD-PIC.

Table 4.3 CD-PIC's composition[4]

Organizations	Form of representation within the CD-PIC
Private R&D organization 1	Each organization designated one official representative and one alternate, with the authority to represent the interests of the organization within the committee.
Private R&D organization 2	
Public University	
Private University 1	
Private University 2	
Departmental Government	
Chamber of Private Entrepreneurs	
Small and Medium Private Firms Federation	

Since it was formed, no new members have been included and all the organizations listed in the table were active at the moment of gathering the data for this study (2011). The composition of the two local platforms, which were to be strengthened during the second phase, also remained unchanged. The composition, involving farmer organizations, local government (municipality), and R&D organizations, is outlined in Table 4.4.

[4] CD-PIC members' different interests and views about their roles and about the functions of the platform are discussed in Chapter 6.

Table 4.4 Local Platforms' composition

Native Potatoes Local Platform	Peach Local Platform
Two producers' associations. Each represented by its President and Vice-president.	Three producers' associations. Each represented by its President and Vice-president.
One Union of Agricultural Producers. Represented by its President.	Three local governments. Each represented by the responsible of the Municipal Unit of Productive Development.
One local government. Represented by the responsible of the Municipal Unit of Productive Development.	Two R&D organizations providing agricultural research services. Each represented by a representative designed by the organization.
Two R&D organizations providing agricultural research services. Each represented by a representative designed by the organization.	

According to its internal regulations, the CD-PIC was created both as a body of technical and administrative direction of the programme and as a body of strategic orientation of agricultural innovation processes in Cochabamba (CDC-PIC, 2009, 20010). It was established that local platforms should be the space where farmers' organizations together with other local actors: i) generate research and technology transfer mandates; ii) interact with the research and technology transfer service providers recruited within the bidding process of projects allocation; and iii) monitor and evaluate the extent to which the projects satisfy farmers' needs. Table 4.5 details these functions.

Table 4.5 CD-PIC's functions[5]

As a body of technical and administrative direction of the Continuous Innovation Programme	As a body of strategic orientation of agricultural innovation processes in Cochabamba
– Evaluate and approve the annual operating plan of the programme in Cochabamba – Evaluate and take decision over the competitive process of allocation of projects in response to the mandates of research and technology transfer generated by the local platforms.	– Promote the formation of new local platforms in accordance with departmental development priorities – Promote all types of organizational synergies and complementarities with other relevant organizations to generate agricultural innovation programmes at departmental level.

[5] Local Platform members' different interests and views about their roles and about the functions of the platform are discussed in Chapter 6.

Table 4.5 (continuation)

As a body of technical and administrative direction of the Continuous Innovation Programme	As a body of strategic orientation of agricultural innovation processes in Cochabamba
– Monitor and evaluate the performance of the technical secretary of the committee. – Approve and control the allocation and use of funds provided by the programme to the operation of the committee, technical secretary, and local platforms – Evaluate and approve technical and administrative reports – Form special commissions to address specific issues associated with the progress of the programme: problems, opportunities, new requirements.	– Promote organizational articulation and the realization of forums or other forms of reflexion, to contribute in the analysis and setting of agricultural innovation policies at departmental level in correspondence with departmental policies and development priorities.

Extracted and summarized from the Internal Regulation of the CD-PIC (CDC-PIC, 2009) and from the Operative Model of the Continuous Innovation Programme in Cochabamba (CDC-PIC, 2010).

Finally, the CDC in accordance with the Continuous Innovation Programme design hired a technical team with the responsibility of facilitating the implementation of the programme at local and departmental levels. With the name of Technical Secretariat of the Continuous Innovation Programme this team was expected to work close to the CD-PIC and Local Platforms. The Technical Secretariat was assigned with the functions outlined in Table 4.6 (CDC-PIC, 2009).

Table 4.6 Technical Secretariat's functions

Working at departmental level	**Working at local level**
1. Prepare and present periodically to the CD-PIC, technical and financial reports about the progress of the programme 2. Keep record and facilitate the access of all the information generated by the programme and by the CD-PIC 3. Propose research and technology transfer projects for consideration and approval by the DC-PIC based on the mandates generated by the local platforms 4. Supporting the CD-PIC to operate with transparency, accountability and efficiency, regarding the use of the resources provided by the programme	1. Strengthening local platforms members' capacities to manage research and technology transfer projects, including the (Identification and prioritization of technological needs, monitoring and evaluation) 2. Facilitating local platforms' relations and interactions with other organizations, including services providers and the departmental platform

Figure 4.1 below provides a diagrammatic summary of how the Continuous Innovation Programme was put into practice.

What stands out from the discussion so far and from Figure 4.1 is that both, the departmental and local platforms as well as the Technical Secretariat, were organized in practice as operational structures for the implementation of the Continuous Innovation Programme.

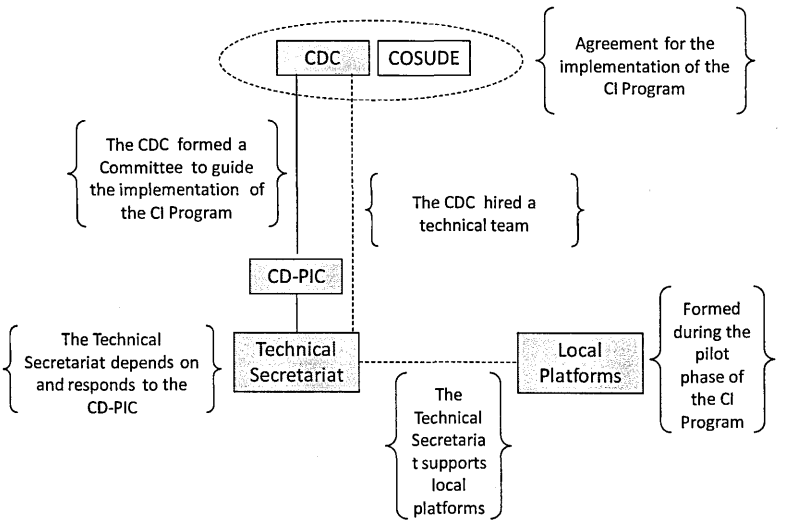


Figure 4.1 Structure of the Continuous Innovation Programme in practice

4.6 Conclusions

The discussion in this chapter indicates that the challenge of articulating farmers, NGOs, public and private R&D organizations, market agents and other service providers remains valid for the new Bolivian System of Agricultural, Livestock and Forestry Innovation. This challenge is compounded by the high diversity and variation over time of the agro-ecological conditions in which agricultural production takes place, the very large number of socially and economically diverse production units (smallholder) involved in

agricultural production and by the presence of a large number of public and private R&D organizations, service providers and NGOs working in rural areas, which differ in terms of size, field of specialization, political and religious orientation, ways of thinking and working.

The context of agriculture in Bolivia and attempts to bring about innovation are therefore highly complex. The Bolivian government, through the National Institute for Innovation in Agriculture and Forestry and with the financial support of the World Bank, is currently implementing a R&D project that has among its goals the formation and operation of departmental and local multi-stakeholder platforms for pro-poor innovation across the country, which implicitly encompasses a process of institutional innovation in terms of the development and enforcement of operational rules that enable platform members to act collectively. This research, by studying the two cases outlined in Section 4.5, will therefore contribute theoretical and empirical insights to enable the improvement of this national R&D project. More broadly, it will inform the design and operation of R&D projects when they are used to drive institutional innovation processes aimed at strengthening agricultural innovation, and suggests how research into innovation processes with academic and action-oriented purposes may be best carried out.

In this regard, following the research process for data collection and analysis discussed in Chapter 3, the cases are explored in Chapters 5 and 6. Then Chapter 7 discusses the findings using the conceptual framework developed in Chapter 2 and Chapter 8 discusses the theoretical and practical contributions of this research.

Chapter 5 Building multi-stakeholder platforms to foster pro-poor market-driven innovation: the ANDIBOL case

5.1 Introduction

In accordance with the conceptual framework developed in Chapter 2, this chapter focuses on three aspects of the ANDIBOL case:

i. how over time the different participants in ANDIBOL built their own understanding and expectations about the platform;

ii. how different understandings and expectations corresponded to, were affected by, or shaped in practice the critical conceptual components of the Papa Andina Model and the definitions contained in the InnovAndes Projects design; and finally,

iii. how the operation of the platform was differently perceived by the participants in line with or in contradiction to their understandings and expectations.

This chapter presents and discusses in a sequential manner the evidence gathered through the process of data collection and analysis discussed in Chapter 3. As such, Section 5.2 corresponds to the "approaching the case stage" of the research process (stage 1) and discusses evidence about the extent to which ANDIBOL came to life in correspondence with the guidelines offered by the Papa Andina Model and the InnovAndes Projects design. Therefore, the analysis is aimed at identifying whether the purpose, composition, functions, and members' role and positions were defined according to the model's and R&D project's guidelines, and the extent to which they were adopted or shaped in practice by the actors involved.

Section 5.3 discusses the evidence collected in the "exploratory step" (step 1) of the "understanding the case stage" (stage 2) of the process of data collection and analysis. This is the discussion of ANDIBOL members' different views about the ANDIBOL's

objectives, functions and members' roles three years after its formation. As discussed in Chapter 3, data analysis in this exploratory step was also aimed at identifying from "who knows best" the themes through which the operation of ANDIBOL could be researched in-depth in the "deepening step" (step 2) of the "understanding the case stage" (stage 2) of the research process. This is precisely the aim of Section 5.4: to discuss ANDIBOL members' different views about the operation of the platform in relation to the themes identified in the exploratory step:

- ANDIBOL's structure of relationships between members (Sub-section 5.4.1)
- ANDIBOL members' participation (Sub-section 5.4.2)
- Decision making process and the role of facilitation (Sub-section 5.4.3)
- ANDIBOL internal management (Sub-section 5.4.4)

Finally, in the light of evidence discussed throughout the chapter, conclusions regarding whether ANDIBOL evolved as proposed by the Papa Andina Model and the InnovAndes Projects, in correspondence with or in contradiction to ANDIBOL members' understanding and expectations, as well as conclusions about the factors influencing such evolution are offered in Section 5.5. Following the conceptual framework of this research (Chapter 2), this chapter ends by arguing that the interaction of the InnovAndes project design, the heterogeneous attributes of the participants, and how the facilitation of interactions and relationships among the stakeholders was performed, influenced how ANDIBOL evolved. The general finding was that ANDIBOL did not take place and operate as proposed by the Papa Andina Model, nor as expected by the actors involved, and that the design of the InnovAndes was decisive in this respect. A theoretical discussion of this finding is offered in Chapter 7.

5.2 Putting the Papa Andina Model and the InnovAndes Project into practice: the formation of ANDIBOL

This section discusses evidence about the extent to which ANDIBOL came to life in correspondence with the guidelines offered by the Papa Andina Model and the InnovAndes Projects design. Therefore, the analysis in this section is aimed at analyzing whether the purpose, composition, functions, and members' role and positions with which ANDIBOL came to life corresponded to the model's and R&D project's guidelines, and the extent to which they were adopted or shaped in practice by the actors involved in the formation of the platform.

The Papa Andina Model proposes multi-stakeholder platforms as a multi-organizational form of collaboration between actors relevant for innovation. Correspondingly, in accordance with their conceptual basis, it proposes a set of conceptual guidelines in relation to how a multi-stakeholder platform should be composed, what functions it should perform and about the nature of the rules that should guide its operation.

The Papa Andina Model indicates that market opportunities are the force guiding the process of innovation, and that this process might permit poor farmers and other market actors to take advantage and benefit from these opportunities. By assuming market opportunities as a trigger for innovation and by defining that the platform brings together actors from the different links of the market chain along with research and development organization and other service providers, the model suggests that the platform should accomplish two different functions. First, multi-stakeholder platforms are expected to be used to address market coordination problems by connecting otherwise unconnected actors, articulating the demand for products and services with their corresponding supply, and serving as a space where actors agree the terms of their commercial exchange. According to the model, the second function establishes that the platform ought to permit

the articulation of actors' different innovation needs, facilitating linkages between relevant actors for innovation, bringing R&D organizations, NGOs and other supporting organizations in to provide technical and other types of support in order to solve the constraints faced by actors in exploiting market opportunities.

Underlying these functions is the idea that all the participating actors should have a similar level of influence on the decision making processes and benefit equally (or experience disbenefits equally) from the results of these decisions. This consideration applies equally to decisions regarding the function of coordination and governance of the market chain and to the function of stimulating joint innovation and formulating demand for research technology transfer and other type of services.

At the same time, the model offers guidelines regarding the rules governing participating actors' roles, behaviour, contribution, and interactions. Regarding the function of market chain coordination, rules are expected to reduce the transaction costs that the participating actors confront in accessing information about goods, services and parties involved in commercial exchanges, and to reduce the difficulties in developing and enforcing commercial exchange agreements. On the other hand, rules are also expected to be consistent with market signals, guiding actors' commercial relationships on the basis of these signals (prices, quality, volume and timeliness standards).

Regarding the function of stimulating joint innovation and formulating demand for research, rules are expected to reduce the transaction costs that farmers and firms confront in accessing information about research and technology transfer supply and about the corresponding providers. Rules are also expected to reduce the transaction costs that research and technology transfer service providers face in accessing information about farmers' and firms' demands, and consequently in adjusting their services to better serve those demands.

The discussion turns now to the differences and similarities between the model's guidelines and the InnovAndes Project design in relation to the platforms' composition, functions and members' roles and position. Table 5.1 summarises the data in this respect.

Table 5.1 Correspondence between the Papa Andina Model and the InnovAndes Project design

Guidelines regarding	The Papa Andina Model	The InnovAndes Project
Platform's composition	Farmers, other market chain actors, R&D organization and other service providers	Farmers, other market chain actors, R&D organizations and other service providers
Platform's functions	Market chain coordination: articulating the demand for and supply of products and services, and facilitating the development and enforcement of exchange agreements. Stimulating joint innovation, formulating demand for research and technology transfer, and managing the process of innovation in order to solve the constraints faced by market chain actors in exploiting market opportunities	Improving farmers' access to profitable markets, facilitating their linkages and interactions with other market chain actors. Improving farmers' access to new technologies to overcome the productive constraints they face in accessing and benefiting from market opportunities.
Platform members' role and position	All the participating actors should have a similar level of influence on the decision making processes and benefit equally (or experience disbenefits equally) from the results of these decisions	R&D organization: facilitator of the platform and provider of research and technology transfer services to farmers Local NGO: provider of technology transfer and organizational support services to farmers Other Market Chain actors: buyers and market information providers. Farmers: beneficiary

Although both the model and the project propose the same composition of the platform, Table 5.1 shows that it was at the level of functions that differences appeared. While the model proposes functions that conceptually correspond to the functions of demand articulation, network formation and innovation process management defined in the literature on innovation brokers discussed in Chapter 2, the InnovAndes project design

converted the platform's functions into something resembling services aimed at helping farmers in accessing technical support and profitable markets. In accordance with these guidelines, the role of the R&D organization and the local NGO within the platform was defined as providers of services, farmers were defined as beneficiaries, and firms were expected to act as buyers of products and market information providers within the platform. The position conferred to farmers as beneficiaries of the platform not only contradicts what is proposed in the Papa Andina Model, but also the conceptual definition of the functions of demand articulation and innovation process management discussed in Chapter 2. According to the literature demand articulation refers to the articulation of different innovation visions and needs with their corresponding supply (Klerkx and Leeuwis, 2009; Klerkx et al, 2009a), while innovation process management refers to the facilitation of the alignment of different actors around shared visions and common objectives (Klerkx et al, 2009a). None of these definitions suggests (at least conceptually) any particular position for any particular type of actor.

The discussion turns now to how the guidelines in the Papa Andina Model and in the InnovAndes project design were put into practice when ANDIBOL was formed. The composition, objectives and functions with which ANDIBOL came to life have been outlined in Chapter 4. However, to what extent did these dimensions correspond to the guidelines of the Papa Andina Model and the InnovAndes project design?

The central elements included in both the Papa Andina model and the InnovAndes project design in relation to the purpose of the platforms were changed by participants when defining ANDIBOL's strategic plan. While the model and the project proposed fostering innovation at the centre of the platform's purpose, participants put the facilitation of business realization at the centre and the "pro-poor farmers" orientation included in the model and in the project was included as a characteristic of the businesses. The realization of this central aim was expected to be facilitated within the platform as "socially

responsible businesses", but without orientation toward any particular actor as proposed in the InnovAndes Project.

Regarding the definition of functions, the strategic plan appears to follow the Papa Andina model guidelines. Both the strategic line of business development and the strategic line of technological innovation defined in the strategic plan, involve the main elements contained in the Papa Andina Model regarding the functions of market chain coordination and stimulating joint innovation. In this sense, the ANDIBOL´s strategic plan did not consider the platform´s functions as services aimed at helping farmers in accessing technical services and profitable markets as the InnovAndes Project did.

Finally, the roles and position of the R&D organization and local NGO in ANDIBOL´s strategic plan appear to follow the InnovAndes project design. However farmers were not considered as beneficiaries, but as providers of Andean products in response to participating firms' demands for products, and firms were additionally assigned with the role of cooperating with farmers through their engagement and commitment in developing socially responsible businesses.

As discussed in Chapter 4, almost all the results of the analysis of strengths, weaknesses, opportunities and threats that participants undertook to define ANDIBOL´s strategic plan related to the development of businesses between farmers and firms, involving the participation of service providers and supporting organizations. Consequently the facilitation of business development appeared as the central element of the objective of ANDIBOL. This focus represents in turn the most significant adjustment to the central elements of the guidelines in both the Papa Andina model and the InnovAndes project design, which were, in contrast, the fostering of market oriented innovation and the pro-poor elements.

5.3 ANDIBOL´s objective and functions viewed from the perspective of its members

This section discusses ANDIBOL members´ different views about ANDIBOL´s objectives, functions and members' roles three years after the formation of the platform. According to the evidence the main differences referred to: i) whether the platform was considered as a pro-poor development initiative; and ii) whether the promotion of innovation was considered as a "farmers´ needs" or as a "business realization" driven process, and therefore whether fostering innovation or facilitating business realization was considered as the main objective or function of the platform. The evidence also showed that underlying these differences were the expectations that each member had about the benefit that they might receive from participating in the platform, and their different traditions of thinking and working.

As outlined in Chapter 3, members´ views about whether the objective and functions of the platform as stated in ANDIBOL´s strategic plan corresponded to the interests of all the participants were initially captured in an electronic questionnaire and then validated and deepened through individual semi-structured interviews. The questionnaire was sent to the representative of the participating R&D organization, local NGO, the representative of the international foundation, each of the owners of the three participating medium scale food processing firms and the owner of the company specializing on foreign trade logistics. Farmers´ points of view were gathered using a focus group session.

The results of the electronic questionnaire are showed in Table 5.2. The answers provided by the representative of the R&D organization, local NGO and the international foundation are grouped under the label "Supporting Organizations" and the label "Firms" includes the answers offered by the owners of the medium scale food processing firms and by the owner of the company specializing on foreign trade logistics.

Table 5.2 ANDIBOL members' different views about the objective and functions of the platform

Whose interests did the objective and functions of the platform as stated in ANDIBOL's strategic plan correspond to?	Supporting organizations' point of view			Firms' point of view			
	R&D organization	Local NGO	International foundation	Firm 1	Firm 2	Firm 3	Company of foreign trade logistic
All the members	■	■		■	■		
Farmers only							
Supporting organizations only							
Firms only							
Farmers and supporting organizations only						■	
Farmers and firms only			■				■
Firms and supporting organizations only							

According to the evidence collected through the electronic questionnaire there were coincidences and divergences between members regarding whether ANDIBOL's objective and functions represented the interests of all or not. For example, the representatives of the R&D organization and the Local NGO with the owners of the Firm 1 and the Firm 2 agreed in considering that ANDIBOL's objective and functions stated in the strategic plan expressed or involved the interests of all.

When the Firm 1's owner was asked to interpret the data contained in Table 5.2 during an interview, he explained that: *"When we came to formulate the objectives of the platform, we agreed in identifying that the realization of businesses represented a shared interest among firms, farmers, and supporting organizations. We [firms and the farmers] live by buying and selling products and the supporting organizations have the mission of helping farmers to improve their life conditions. Therefore, the idea to have the platform as a space where business relations could be promoted and facilitated was attractive to all."*

In the same vein, the representative of the R&D organization asserted that: *"Farmers always ask for support to improve their income levels. Generally this requirement has two aspects. One aspect has to do with technologies to overcome productivity problems and the*

other is associated fundamentally with market access problems. The idea to have a platform to facilitate the commercial relationship among farmers and firms was an alternative to satisfying these requirements and also was coherent with our organizational mission. On the other hand, the firms also have the interest of doing business, and the idea of channelling this interest in a socially responsible way through the platform was very interesting."

This evidence seems to indicate that when actors from different links of a specific agricultural market chain are brought together to act collectively, the nature and characteristics of actors' previous relationships and how they see one another play a determining role in reaching an initial consensus. According to the point of view of the firms' owner and R&D organization representative, farmers and firms, based on previous experiences and recognizing their own position inside the market chain, considered their relationships as mainly of a commercial nature in which they act as sellers or buyers of products. In general terms they considered these type of relationships difficult to build, having high transaction costs, and risky. In this context, the possibility of intervening in the characteristics of these relationships and overcoming their limitations became the unifying "glue", and it constituted the essential component around which all actors initially agreed on the objective and functions of ANDIBOL.

Differently, Table 5.2 shows that the representative of the international foundation and the owner of the company specializing on foreign trade logistics coincided in asserting that ANDIBOL's objective and functions only represented the interest of farmers and firms. During the interview held with each of them they expressed their point of view as follows:

"It was completely logical and I agreed that, when ANDIBOL started, its objectives were defined considering the interests of farmers and firms around commercial issues. Our interests as an International Foundation were and are still to help farmers and firms in

developing small and medium scale businesses. Therefore it can be said that our interests were also included, indirectly, in the formulation of the objectives of the platform" (International Foundation representative).

"I think that it was coherent that when we defined the objectives of the platform we thought basically about the interests of the actors that make a living selling and buying products, that is, farmers and food processing firms. Supporting organizations do not have a direct stake in business, but they agreed the objectives of the platform because as development institutions they seek to help farmers to improve their living conditions" (owner of the Company Specializing on Foreign Trade Logistics).

According to these explanations it seems that, despite the differences showed in Table 5.2, all the interviewees, except the owner of Firm 3, agreed that the objectives of ANDIBOL as stated in the strategic plan involved the interests of all. The owner of the third firm was the only respondent to the questionnaire who affirmed that only the interests of the farmers and those of the supporting organizations were considered in the definition of the objective and functions of the platform. During the interview he asserted that:

"Although all the participants agreed on defining business development as the main objective of the platforms, three years after, no businesses have been developed, at least as I anticipated - I think because the supporting organizations focussed their work on supporting farmers without considering the interests of the firms" (Firm 3's owner).

This explanation seems to indicate that the owner of Firm 3 was more concerned about the operation of the platform, rather than suggesting that the objective and functions of ANDIBOL were defined only with respect to the interests of farmers and supporting organizations.

Finally, the following statement was provided by a representative of the farmers' organization in the focus group session:

"We always have problems in accessing markets in the big cities. Normally we don't have other options than to sell our products to retailers in local [rural] markets, getting low prices for our products. Here in the platform we had the support of the "projects" [the R&D organization and the local NGO] to meet entrepreneurs [firms] that they could buy our products paying better prices" (President of the Farmers' organization).

However, when the discussion during the interviews moved on to explore whether there was a common understanding about the objective and functions of the platform, important differences arose among participants regarding the rationale of ANDIBOL's existence. The evidence showed that underlying these differences were expectations about the benefits that those participating in the platform might receive, underpinned by the variety of members' traditions of thinking and working.

For example, according to the supporting organizations, ANDIBOL constituted a space for promoting innovation processes in response to poor farmers' needs. In this sense farmers' needs were viewed as a trigger for innovation and also as the motive for business development. Consequently, the supporting organizations asserted that ANDIBOL should be the space where poor farmers could meet and negotiate with potential clients to sell their products in terms that allow them to earn higher incomes than those normally obtained in traditional markets. In this sense firms were seen as socially responsible clients that should be willing to cooperate with and to work with farmers in a horizontal way. This meant, among other things, that firms should be willing to transfer part of their gains by paying farmers higher prices than those they traditionally paid when they purchased products from other providers.

In the same vein, supporting organizations considered the function of stimulating innovation as central in the operation of ANDIBOL, to enable farmers to overcome the constraints affecting their capabilities to respond adequately to market requirements. In this sense, the platform was understood as a space where R&D organizations could enrich and adjust their research and technology transfer agendas with demands coming from both sides of the market chain: that is, from farmers and from the final consumers in urban markets, using the information provided by firms participating in the platform.

The following statements captured in the interviews exemplify this discussion:

"The platform is not just for buyers and sellers to meet each other and do business for once. It is a space to build long term relations of trust as the basis to do fair businesses that benefit farmers and firms equitably" (Representative of the R&D organization).

"According to our vision the development of socially responsible businesses should be viewed as an alternative to promoting development in which farmers and firms should work and negotiate in equitable conditions. This means among other things that firms should be willing to pay farmers better prices than those that they normally pay to other providers" (Representative of the local NGO).

"We [all platform members] should be aware of the requirements, limitations and conditions in which farmers work. Changes in the fields of farmers to improve the quality of their products does not happen from one day to the next, but they are necessary if market requirements are to be fulfilled. We [the R&D organizations] have to adjust our research activities and our technologies to better serve farmers' requirements" (Representative of the R&D organization).

"When we talk about working with farmers, business development and innovation efforts cannot be viewed separately, they have to go one alongside the other. We all should be aware that this is a process that takes time. This is why we have the InnovAndes project

supporting both side of the same coin: innovation and the development of equitable businesses" (Representative of the International Foundation).

For their part, when firms' owners were asked about what they thought about the supporting organizations' visions regarding ANDIBOL, they stated that:

"Supporting organizations, based on their interest of benefiting poor farmers have a social and developmental vision of the platform" (Owner of Firm 1).

"They [the supporting organizations] typically work with procedures and steps common in development projects, carrying out activities that take a long time and looking for long term solutions to the problems faced by farmers" (Owner of Firm 2).

"The supporting organizations, especially the R&D organization, consider that the development of businesses and also the generation of innovations should be oriented to benefit farmers. This does not correspond to my understanding about the world of business. Of course farmers have their own innovation needs and they have to gain from businesses, but also we have our requirements and we expect to gain as well" (Owner of Firm 3).

The discussions held with interviewees made evident that the supporting organizations' vision detailed above contrasted with the point of view of the participating firms concerning the objective and functions of ANDIBOL. According to the data provided by firms' owners in the interviews, the initial objective with which ANDIBOL was created was to foster and facilitate the development of businesses involving farmers and firms to generate income in an equitable and win-win relationship. In this sense, the firms considered that, being part of the platform, they would have the possibility to carry out more and better business by contacting and creating links with farmers' organizations with the potential to provide them with the products they needed to take advantage of market opportunities. Because these relations were normally difficult, very costly and risky to

build, they expected that ANDIBOL would provide the space in which those relations could be developed, with the support and facilitation of the organizations that give technical and organizational support to farmers.

Consequently, firms expected that R&D and other supporting organizations would act initially as a bridge, facilitating initial contacts and links with farmers by enabling the flow of information between both parties. In addition, because supporting organizations had a well grounded experience in working with farmers around technical and organizational issues, firms expected that they would support farmers in meeting firms' requirements

In this sense, the firms' owners interviewed agreed with situating business development as central in the objectives of ANDIBOL and therefore they asserted that the operation of the platform should be assessed in terms of the facilitation of commercial exchanges between them and farmers, the development of new commercial products and their insertion into new markets, and the improvements in their commercial relationships with farmers. In this context, they neither recognized that the platform was a development initiative in which farmers had the status of final beneficiaries, nor situated the promotion of pro-poor innovation as an objective. Instead, they considered that innovation efforts within the platform should be functional to the development of businesses and that agricultural research and technology transfer supporting farmers should be part of research and development projects conducted by the supporting organizations outside the platform.

The following statements captured in the interviews exemplify firms' points of view:

"One of the difficulties that ANIDIBOL encountered and is still facing is how to harmonize or link apparently conflicting or antagonistic visions and ways of working among stakeholders. Supporting organizations consider the platform as an effort to support farmers. Instead, we [the firms] look at the platform fundamentally as a space to do business" (Owner of Firm 2).

"Because market opportunities change continuously and rapidly, we [the firms] seek quick solutions to our problems in order to take advantage of business opportunities: what is an opportunity today may no longer be one tomorrow. We recognize that innovation in the field of farmers and the support of their organizations are very important, but it takes too much time and business opportunities do not wait so long. Therefore, I consider that the development of innovations should consider short run responses to solve the problems we confront in exploiting business opportunities" (Owner of Firm 1).

"We [the firms] think that inside the platform innovation efforts have to be focussed on solving the problems of processing and selling products. Those efforts regarding farmers' production problems have to be supported through development projects outside the platform. If we agree that the objective of ANDIBOL is the development of businesses, as we did three years ago, I think that at this moment we need to clarify and agree that the platform is not to serve farmers, but to develop new products, to find new markets, and to improve the commercial exchange between farmers and firms" (Owner of Firm 3).

So far the discussion has highlighted differences in perceptions between firms and supporting organizations about the rationale of ANDIBOL's existence, its objective and functions. These were differences that arose despite the initial consensus in affirming that the platform's objective and functions stated in the strategic plan reflected the interests of all. With this in mind, the discussion now turns to the farmers' points of view about these concerns, using the data from the focus group session.

The discussions during the focus group session reflected farmers' fragmented view of ANDIBOL in the sense that they did not consider the platform as a space where actors from different backgrounds converge and interact in pursuing common interests. On one hand, they considered that the platform was a group of private companies interested in buying their products, formed and guided by the supporting organization as an effort to

find better market opportunities. Therefore, they narrowed their relations with firms in the platform to commercial relations in which the supporting organizations acted as intermediaries.

On the other hand, farmers did not recognize the platform as a place where their needs for research and technology transfer could be expressed and discussed along with the needs of the other actors, nor did they make the link between technology improvements and the exploitation of businesses opportunities. On the contrary, all aspects of technology improvements were considered as part of the services provided by the supporting organizations working with them in the context of development projects.

During focus group discussions it became evident that this way of looking at the platform had its origin in the traditional ways that farmers had working with R&D organizations and NGOs in development projects in the past. Based on this tradition, farmers situated themselves as receptors of services provided by supporting organizations. Accordingly, processors, retailers, and other market agents were viewed as clients, and the supporting organizations as service providers and facilitators of their relations with other actors.

The evidence so far suggests that the tradition of working and thinking, and the expectations of the different stakeholders, were decisive in how each actor built up their own understanding about the rationale of ANDIBOL´s existence, objective, functions and other members´ roles and positions within the platform. The main differences referred to whether each actor perceived the nature of the platform as a space to promote innovation or business development, or both.

On the one hand, participating firms situated business development as central in the objective of ANDIBOL and considered business development as a trigger for innovation. By contrast, supporting organizations characterized the platform as a development initiative in favour of the farmers, and they saw farmers' needs as trigger for innovation

and source of orientation to the development of business. For their part, farmers did not consider business development or the promotion of innovation either as objectives or as functions of the platform; following their experience of working in development projects, they considered both as services provided by supporting organizations. Table 5.3 summarizes and compares ANDIBOL members' different visions.

Table 5.3 ANDIBOL members' different visions compared

ANDIBOL member vision regarding	Supporting organizations	Firms	Farmers
Platform's purpose	ANDIBOL exists to foster agricultural innovation and business development in favour of the farmers	ANDIBOL exists to promote and facilitate the realization of businesses between farmers and firms	ANDIBOL exist as a service provided by supporting organizations helping farmers in accessing markets and new technologies.
Platform's composition	Farmers, firms, R&D organizations, NGOs	Farmers, firms, R&D organizations, NGOs	Group of clients facilitated by the supporting organization.
Platform's functions	Facilitating farmers' linkages and interactions with other market chain actors to improve their access to profitable markets Improving framers' access to new technologies to overcome the productive constraints they face in accessing to and benefiting from market opportunities.	Articulating the demand for and supply of products and services, and facilitating the development and enforcement of exchange agreements.	Business development and the promotion of innovation are considered as services provided by supporting organizations.
Platform members' role and position	– Farmers: Providers of products and beneficiaries of research, technology transfer and organizational support services. – Firms: Social responsible clients cooperating with farmers in developing fair businesses – Supporting Organizations: Providers of research and technology transfer services, and of organizational and commercial support.	– Farmers: Providers of products – Firms: Buyers of products – Supporting Organizations: Facilitators of the relationships between farmers and firms, and providers of services supporting business development.	– Farmers: Providers of products and receptors of research and technology transfer services, and of organizational and commercial support. – Firms: Clients – Supporting Organizations: Providers of research and technology transfer services, and of organizational and commercial support.

How and to what extent these differences affected the operation of ANDIBOL will be discussed in the next section.

5.4 How did ANDIBOL operate?

This section discusses ANDIBOL members' different views about the operation of the platform in relation to:

- ANDIBOL's structure of relationships between members
- ANDIBOL members' participation
- Decision making process and the role of facilitation
- ANDIBOL internal management

As discussed in Chapter 3, these operational dimensions were identified with the participants as the dimensions through which the operation of ANDIBOL could be researched in-depth.

5.4.1 ANDIBOL's structure of relationships between members

The discussion in this sub-section focuses on the relationships of coordination and information exchange between ANDIBOL members and whether members' different ways of understanding the platform influenced how the structure of these relationships was built and evolved. Data in this regard was initially gathered using an electronic questionnaire and individual interviews were used to validate and deepen the answers to the questionnaires. Data from farmers was gathered using a focus group session.

Figure 5.1 shows graphically the structure of relationships of coordination and information exchange within ANDIBOL. The figure was drawn based on the data collected through the questionnaire. In the questionnaire each platform representative was asked to identify the other ANDIBOL members with whom it held relationships of coordination and information exchange, and in the interviews they were asked to qualify their relationships of coordination as strong or weak and the exchange of information as permanent or

sporadic. According to the literature on social network analysis, relationships can be valued according to their frequency, duration, intensity, or other qualities, asking actors to rank their relationships using ordinal measures (Clark, 2006; Matuschke, 2008).

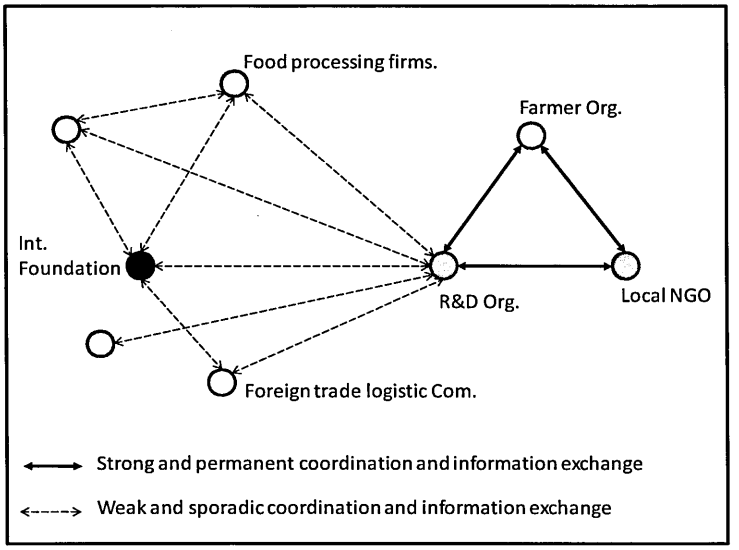


Figure 5.1 ANDIBOL's structure of relationships

The structure of the relationship can be divided in two parts by an imaginary line. On the right-hand side are those members with roles and positions clearly defined in the InnovAndes project design (implementing partners and beneficiaries respectively) and on the left-hand side the other members of the platform with no roles and positions in the project (food processing firms, the international foundation and the company specializing on foreign trade logistics) plus the R&D organization acting as a facilitator. Notably, there are no ties connecting both sides of the structure, except those passing through the R&D organization, reflecting that no direct information exchange or coordination occurred between members located on the different sides of the imaginary line.

According to the data, it seems that the development of strong and permanent coordination and information exchange relationships between the R&D organization, the local NGO and farmers' organization derived from how the supporting organizations balanced their roles

as InnovAndes Project implementing partners and as members of ANDIBOL in correspondence with their vision about the objective and functions of the platform and with their tradition of supporting farmers through R&D projects. According to the supporting organizations' view of the platform (see Table 5.3), one might expect to find them having strong coordination relationships and permanent information exchange not only with farmers but also with firms, in order to accomplish their purpose of benefiting farmers by contacting them with potential clients, and to adjust their own research and technology transfer agendas with inputs coming from the market side. However, weak coordination relationships and sporadic information exchange between firms and supporting organizations seems to indicate that the tradition of supporting organizations in helping farmers through R&D shaped how they built their relationships with the other ANDIBOL members.

On the other hand, the structure of the coordination and information exchange relationships showed in Figure 5.1 appears contrary to what firms mentioned as their interests or motivation to be part of the platform: contacting and creating links with supporting organizations that work with farmers and their organizations as a bridge allowing them to develop better and new business relationships with farmers. As expressed by firms' owners in the individual interviews the weakness of the relationships between firms, between firms and supporting organizations and the absence of relationships between firms and farmers, did not correspond to a pattern of relationships conducive to business realization.

Finally, in the case of farmers it seems that their position and relationships inside the structure match closely with what was described as its fragmented way of seeing the platform (see Table 5.3), and explains why they only held relationships with the supporting organizations implementing the InnovAndes Project.

The following statements provided by the interviewees amongst firms, the NGO and the local R&D organization exemplify what was discussed above. For example the first statement was an indication that the structure of relationships among ANDIBOL members was a reflection of members' different visions about the platform:

"I think that the figure (Figure 5.1) illustrates accurately how our relationships within the platform currently are. I think that it is a result of different visions about ANDIBOL. For example we [the R&D organization and the Local NGO] consider the platform as a space to promote the development of farmers; the generation of innovation and the development of business are means to achieve that. This is why we have, and we can use, the InnovAndes project. Conversely, firms just perceive ANDIBOL [as a means] to make business and this is why they do not engage with and commit to farmers. But if the intention is just making business, probably we do not need the platform" (Representative of the R&D organization).

Regarding the position of the supporting organizations in the structure of relationships, the next two statements made reference to the engagement of these organizations in the implementation of the InnovAndes project and how it affected the development of relationships between members:

"Supporting organizations have strong relations with farmers because they are implementing a project [InnovAndes project] that seeks to help farmers in improving their life conditions. This is why the supporting organizations that manage the project and facilitate the platform have given priority to their relationships with farmers" (Owner of Firm 3).

"We normally act according to what the projects define as possible. This is an advantage because we have resources; but at the same time it is a limitation because projects come

with definitions about what to do and with whom, this is why we have strong relationships with farmers" (Representative of the local NGO).

Finally, the statements below highlighted the absence of direct relationships between farmers and firms and its effects:

I think that after three years, the relationships within the platform do not correspond to an integral view of the market chain. Firms and farmers do not relate each other directly and do not know each other; the supporting organizations are always in the middle" (Owner of Firm 1).

"Supporting organizations are in the middle of our relationships. For example, farmers think – and consequently act – as though they are participating in the platform through the supporting organization and that the platform belongs to these organizations. A similar thought is common among the firms; when we express our needs, we believe that we do this toward the supporting organizations rather than toward the platform" (Owner of Firm 2).

"I consider that the information we need to take decisions within the platform is insufficient or does not arrive on time because we do not have direct information exchange between farmers and firms. I am talking mainly about information on prices, volumes and qualities and other information related to the development of business" (Owner of Firm 3).

The statements above were in line with the data gathered in the interviews regarding whether each platform representative characterized its relationships with other members as strong, weak, permanent or sporadic. Table 5.4 summarize this data.

Table 5.4 Characteristics of the relationships between ANDIBOL members

Representative / owner of:	Coordination relationships		Information exchange relationships	
	Strong	**Weak**	**Permanent**	**Sporadic**
R&D organization	With farmers: Implementing day to day participatory research activities, training events, and organizational strengthening activities. With the Local NGO: Coordinating the implementation of the InnovAndes project	With firms, IF, and CFTL: Mainly limited to regular ANDIBOL meetings. Poor coordination regarding the implementation of actions	With farmers: Regarding the progress in the implementation of actions, farmers' needs whether technological, organizational or commercial needs, and regarding information from other members of the platform. With the Local NGO: Regarding the progress in the implementation of the InnovAndes project.	With firms, IF, and CFTL: Mainly limited to information about farmers and firms supply and demands for products during regular ANDIBOL meetings.
Local NGO	With farmers: Implementing day to day technology transfer activities, training events, and organizational strengthening activities. With the R&D organization: Coordinating the implementation of the InnovAndes project		With farmers: Regarding the progress in the implementation of actions, and farmers' needs whether technological, organizational or commercial needs. With the R&D organization: Regarding the progress in the implementation of the InnovAndes project.	
International Foundation (IF)		With the R&D organization and the CFTL: Mainly limited to regular ANDIBOL meetings. No coordination regarding the implementation of actions		With Firm 1 and 2: Information about market opportunities and firms' innovation needs apart from the information exchanged during the regular ANDIBOL's meetings.

Table 5.4 Continuation

Representative / owner of:	Coordination relationships		Information exchange relationships	
	Strong	Weak	Permanent	Sporadic
Firm 1		With the R&D organization: Poor coordination and monitoring of activities. Mainly limited to regular ANDIBOL meetings.		With the R&D organization: Mainly limited to information about farmers and firms supply and demands for products during regular ANDIBOL meetings. Poor information exchange about firms' innovation needs. With the IF and Firm 2: Information about market opportunities and firms' innovation needs apart from information exchange during regular ANDIBOL meetings.
Firm 2		With the R&D organization, IF and Firm 1: Mainly limited to regular ANDIBOL meetings.		With the R&D organization. Mainly limited to information about farmers and firms supply and demands for products during regular ANDIBOL meetings. Poor information exchange about firms' innovation needs. With the IF and Firm 1: Information about market opportunities and firms' innovation needs apart from the information exchanged during the regular ANDIBOL meeting
Firm 3		With the R&D organization: Poor coordination and monitoring of activities between one ANDIBOL meeting and the next.		With the R&D organization. Mainly limited to information about farmers and firms supply and demands for products during regular ANDIBOL meetings.
Company Specializing on Foreign Trade Logistic (CFTL)		With the R&D organization and IF: Mainly limited to regular ANDIBOL meetings.		

The evidence so far suggests that there was a "structural hole" in the structure of relationships between members within the platform. According to Klerkx and Leeuwis (2008, p.366) "a structural hole exists when parties do not pay attention to each other and do not exchange information in the course of social interaction".

The structure of relationships appears divided into two weakly-connected sub-structures: one involving the participation of farmers and the two supporting organizations implementing the InnovAndes project; and the other involving those actors with no specified role in the project: the three firms, the International Foundation and the Company Specializing on Foreign Trade Logistic. In the middle of the two sub-structures appears the R&D organization acting simultaneously as facilitator of the platform and as implementer of the InnovAndes Project.

5.4.2 ANDIBOL members´ participation

The evidence discussed in this sub-section shows that the level of participation of a particular organizational member, and how this member assessed the participation of others, depended on whether the member was involved in one or other of the sub-structure of relationships discussed in the previous sub-section.

According to the data captured through the electronic questionnaire, there were differences and coincidences in how firms and supporting organizations qualified their own participation inside the platform and the participation of the others. The data gathered in this way was then validated and deepened though individual semi-structured interviews. Farmers' views in this regard were captured through the focus group.

According to the data collected through the questionnaire, it seems that the division of the structure of relationships into two sub-structures was reflected in the characteristics of participation of the different members of ANDIBOL. The data detailed in Table 5.5 shows that there was an apparent consensus between the owners of the food processing firms, the

company specializing on foreign trade logistics and the representative of the international foundation in qualifying farmers' degree of participation ranging from low to very low. In contrast, the data provided by the representatives of the R&D organization and local NGO showed that farmers' participation was qualified as ranging from "medium" to "very high" degree.

Table 5.5 Farmers' degree of participation from the perspective of other ANDIBOL members

Farmers' degree of participation	Other actors' perception						
	Firm 1	Firm 2	Firm 3	Company of foreign trade logistic	International foundation	R&D organization	Local NGO
Very high							
High							
Medium							
Low							
Very low							

When this data was discussed in the interviews, it became evident that these differences in perception apparently corresponded to whether farmers' participation was characterized as participation in the InnovAndes project or within the platform.

For example, it seems from the interviews that the representatives of the R&D organization and the local NGO characterized farmers' participation in terms of their participation in defining, implementing and monitoring actions in the context of the project rather than in the platform. This consideration makes sense with the strong and permanent relationships of coordination and information exchange between farmers, the R&D organization and the local NGO as partners in the implementation of the InnovAndes project. The following statements illustrate this:

"Farmers have a very active participation in all matters related to the project. They are involved not only in the implementation of activities but also in defining and monitoring them. This includes not only activities associated with improvements in production but also activities of commercialization" (Representative of the Local NGO).

"We have a participatory approach to working with farmers. We try to foster farmers' active participation in all the aspects of the projects including their participation within the platform. Although they are still having some problems, I think that in general terms they are improving their capacities to interact and negotiate with other actors within the platform" (Representative of the R&D organization).

Conversely, firms' owners, the owner of the company specializing on foreign trade logistic, and the representative of the international foundation saw farmers' participation within the platform in terms of farmer representatives' attendance and attitude during ANDIBOL's meetings. In this sense, they agreed in asserting that farmers did not participate directly in the platform, but through the supporting organizations that work with them in the InnovAndes project.

The following statements captured during the interviews corroborate these observations:

"Although farmers sporadically attend the meetings of the platform, their participation is passive, merely listening and supporting the views expressed by the supporting organizations" (Owner of Firm 3).

"Normally farmers have a low or very low degree of participation. Nevertheless, the supporting organizations have procedures to gather and prioritize farmers' needs, implementing and monitoring actions as part of the projects they are jointly implementing" (Representative of the International Foundation).

"Farmers receive support from the InnovAndes project many times to respond our requirements for products, but their participation in the platform has been always weak and passive" (Owner of Firm 2).

Regarding the participation of supporting organizations, the data gathered through the electronic questionnaire revealed that firms' owners evaluated supporting organizations' participation as "medium" and "high". This qualification was not far from the evaluation made by supporting organizations of their own participation. Table 5.6 below summarizes this data.

Table 5.6 Supporting organizations' degree of participation

Supporting organizations' degree of participation	Firms' perception				Self perception		
	Firm 1	Firm 2	Firm 3	Company of foreign trade logistic	International foundation	R&D organization	Local NGO
Very high							
High							
Medium							
Low							
Very low							

During the interviews, respondents explained that the characteristics of the participation of the supporting organizations had to do with the presence of the InnovAndes project and the role of these organizations within it. According to the interviews it seems that the R&D organization, in its double role as of facilitator and as of project implementing partner, had the responsibility to participate and to foster the participation of others, and had the financial resources and time to accomplish this responsibility. Therefore, it can be said that the R&D organization had both the commitment and obligation to participate, but also a privileged position to do so. A similar explanation was offered regarding the local NGO, which was assigned with the responsibility to participate and also to strengthen farmers'

capacities to do so. Thus in both cases it can be said that there was a kind of mandate of participation derived from the project.

For example, the owner of Firm 1 stated that supporting organizations, particularly the R&D organization, played a key role as promoters of the formation of the platform, calling for participation, facilitating the initial contacts between the various members, and by encouraging periodic meetings. He said: *"Probably we would never come together if we had not been invited by an institution, particularly the R&D organization. We usually work independently and even more with very little relation to development institutions."* For its part, the owner of Firm 2, explaining the reasons he considered the participation of supporting organizations as high, asserted that: "*Supporting organizations have a high level of participation because they are implementing a project that seeks to help farmers to live better, to have more income. So, encouraging the platform is useful to them in order to achieve this purpose."* In the same vein the owner of Firm 3 said: *"The R&D organization and the Local NGO have the commitment and obligation to participate and to foster the participation of others, especially the participation of farmers, as part of their responsibilities as implementers and leaders of the InnovAndes project."*

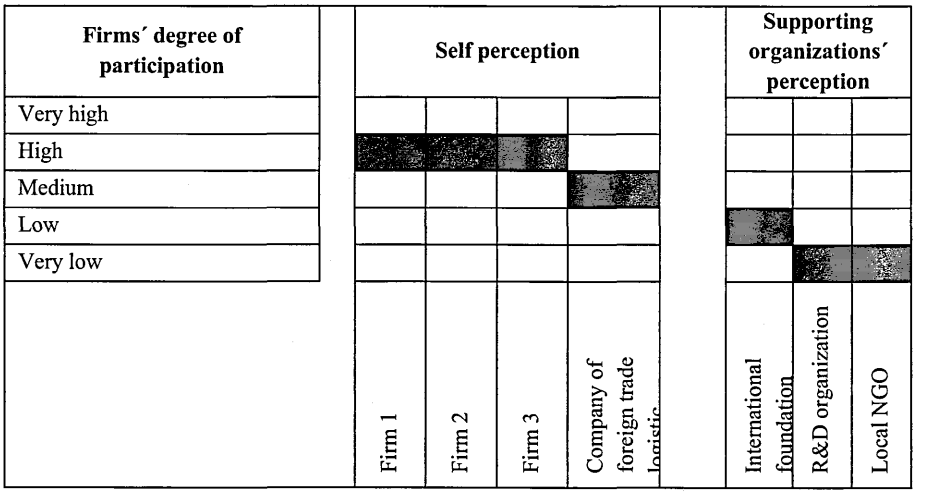
Finally, when the representatives of the supporting organizations were asked to explain the data contained in Table 5.6 in relation to the evaluation that they made of their own participation, they said:

"We seek to develop entrepreneurial capabilities among farmer organizations and small scale firms. Being part of ANDIBOL and having an active participation within it helps us in achieving this purpose because we find that the platform is an innovative way to articulate the type of actors with which we want to work. The platform can be a model that we can use in the future in other projects that we have" (Representative of the International Foundation).

"I consider that we have a strong participation in all the operations of ANDIBOL because we are [the people] who try to foster it, by facilitating the identification of needs, participating in meetings and discussions, contributing with ideas and also implementing actions directly" (Representative of the R&D organization).

Different from the discussion above, Coincidences between firms and supporting organization did not appear when they were asked to qualify the degree of participation of firms (farmers' views in this regard were gathered in focus group session). In this case the separation between the two sub-structures of relationship is useful in interpreting the data showed in Table 5.7. The supporting organizations qualified firms' participation ranging from "low" to "very low". In contrast, firms evaluated their own participation ranging from "medium" to "high".

Table 5.7 Firms' degree of participation



During the interviews, firms' owners explained that they evaluated their participation within the platform in terms of attendance and attitude during ANDIBOL's meetings. They highlighted their active and permanent attendance and important contribution with ideas and market information. Conversely, it seems from the interviews with supporting organizations, that they evaluated firms' participation in terms of firms' engagement and commitment with farmers. Two statements reflected these opposite perceptions.

"I have three years participating actively in all the ANDIBOL´s meetings. Providing ideas and information about new business opportunities and also expressing my demands for products. Unfortunately I only received attention on few occasions" (Owner of Firm 3).

"Normally firms just attend meetings. They propose ideas and provide information, but after that they leave all the work in our hands. Especially they do not engage nor have commitment with work that has to do with farmers" (Representative of the R&D organization).

So far the discussion in this sub-section highlighted differences and similarities in perception between firms and supporting organizations about the degree of participation of the different ANDIBOL´s members. The discussion now turns to the farmers´ point of view, using the data gathered in the focus group session.

In accordance with the farmers´ vision about the rationale of the platform´s existence, objective and functions discussed in Section 5.3, during the focus group session farmers expressed that they had active participation in defining, implementing and monitoring the actions that they jointly carried out with the supporting organizations. This perception closely matches with the evaluation that supporting organizations made regarding farmers´ participation.

Also in the focus group session it was evident that, although participants asserted that they had attended ANDIBOL´s meetings occasionally, they considered these meetings just as an instance facilitated by the supporting organizations to get to know potential urban clients. This perception has similarity with the qualification that firms made in relation to the participation of farmers in the platform.

Finally, when farmers were asked to express their opinion regarding the participation of firms, they did not think that firms ought to have any other participation in the activities

that they were jointly implementing with the supporting organizations, apart from demanding and buying products.

The evidence so far suggests that the characteristics of the participation of the different ANDIBOL´s members were influenced by the InnovAndes Project design, which in turn gave rise to the structural hole in the relationships between members. The R&D organization and the Local NGO, as implementing partners of the project, had the responsibility and commitment to participate and to foster the participation of others. At the same time they had the financial resources and time to accomplish this responsibility.

This is not the case for firms. Their participation depended almost exclusively, or was conditional, on the satisfaction of their interests of making business and on the encouragement they received from supporting organizations. Regarding this last point, there was a consensus among firms in considering that the supporting organizations have played a key role in promoting the formation of the platform, calling for participation, facilitating the initial contacts between the various members, and encouraging periodic meetings. Finally, firms considered that farmers' participation in the platform was weak and almost always carried out through the intermediation of the supporting organizations, in correspondence with their self-perception as beneficiaries of R&D projects.

5.4.3 Decision making process within ANDIBOL and the role of facilitation

This sub-section discusses ANDIBOL members´ views about the pattern of participation of members in the decision making processes within ANDIBOL and the role of facilitation of the R&D organization. The evidence suggests that there was a tension between firms and supporting organizations regarding whether the decisions made in ANDIBOL represented the interests of all members or just of some of them, and that the facilitating role performed by the R&D organization affected how these decisions were made.

Using the same electronic questionnaire referred in to the previous sub-sections, the different ANDIBOL members were asked to qualify whether the decisions taken in ANDIBOL represented the interest of all or instead the interests of some of its members. Table 5.8 summarizes the data collected through the questionnaire.

Table 5.8 ANDIBOL members' perception about whether the decisions taken in ANDIBOL represented the interest of all or only some of its members

The decisions taken in ANDIBOL represented mainly the interest of:	Supporting organizations' point of view			Firms' point of view			
	R&D organization	Local NGO	International foundation	Firm 1	Firm 2	Firm 3	Company of foreign trade logistic
All the members			■				
Farmers only						■	
Supporting organizations only							
Firms only	■	■					
Farmers and supporting organizations only				■	■		■
Farmers and firms only							
Firms and supporting organizations only							

According to the firms, one of the factors that led to decisions mainly responding to the interests of the farmers and supporting organizations was the fact that the formation and operation of the platform was part of the objectives of the InnovAndes project. Different explanations were provided in this regard.

One explanation focused on the definition of roles and of who should be responsible for them in the InnovAndes project design. Firms' owners perceived that the influence of the project was partially exercised through the R&D organization which had been assigned to accomplish multiple roles: the facilitation of ANDIBOL, provider of research and technology transfer, and leader of the implementation of the InnovAndes project.

According to the firms' owners' point of view, the assignment of multiple roles to the R&D organization introduced a bias in favour of the interest of the farmers. The consequences of this were clearly identified by firms when they asserted that the decisions

within ANDIBOL were made in correspondence with what was defined in the InnovAndes project design about the objective and functions of the platform and, as such, decisions responded to the expectations of farmers and of the supporting organizations rather than those of firms.

The following three statements captured during interviews made reference to the engagement of the supporting organizations in the implementation of the InnovAndes project and how it affected whether the decisions taken in ANDIBOL represented the interest of all or only some of its members:

"The decisions that have been taken within the platform have not resulted in the realization of business between farmers and firms. This is because the supporting organizations that manage the project and facilitate the platform have given priority to research, technology transfer, training and strengthening actions in favour of farmers, leaving aside the interests of the firms participating in ANDIBOL" (Owner of Firm 3).

"While it is true that the food processing firms have expressed their demands and needs toward the platform, they have not received the same priority as those expressed by farmers directly to the supporting organizations. I believe this happened because the supporting organizations have as their priority the implementation of the project" (owner of the Company Specializing on Foreign Trade Logistics).

"We have expressed our needs and ideas of innovation to the supporting organizations, but only sometimes they have been heard and prioritized, and have almost never become concrete actions" (Owner of Firm 1).

Conversely, during interviews with representatives of the supporting organizations, it was evident that there was agreement, especially between the R&D organization and local NGO representatives, that decisions taken in ANDIBOL mainly represented the interests of the firms. They supported their point of view by observing that the objective of the

platform has been strongly influenced by the perspective of the firms without considering sufficiently the interests and reality of farmers. They also noted that the agenda of discussion at ANDIBOL's meetings has been notably directed to themes associated with the realization of business, almost always trying to satisfy the requirements of the firms.

In addition to that, supporting organizations' representatives asserted during interviews that normally firms behave passively, waiting for supporting organizations to meet their requirements, and implement actions whether related to the development of business, facilitation of relationships among ANDIBOL members, or associated with the generation of innovation. Regarding these issues, the following statements were offered by interviewees:

"During the platform meetings, we normally discuss firms' demands for products and whether farmers are capable to satisfy them. Unfortunately firms ask for quick responses. They do not understand or do not consider that farmers decide their production with one year in advance and that they also have other commitments. Additionally, when farmers cannot meet firms' demands, the firms normally express their complaints to us" (R&D organization representative).

"I think that one of the problems of the platform is that firms' owners consider the platform just for discussing themes related to business development, for example they are not interested in analyzing issues associated with innovation, even less if they are linked with the problems faced by farmers" (Local NGO representative).

Another set of explanations given during the interviews referred to how ANDIBOL's members perceived their own status inside the platform. As the formation and operation of ANDIBOL was part of the project, and the implementation of the project a responsibility pertaining to the R&D organization that facilitates the platform, it was perceived that

ANDIBOL belongs to the facilitator. This aspect was a shared concern by all members, but argued differently, as can be seen in the following statements:

"I believe that at the beginning all the members considered that ANDIBOL belonged to the supporting organizations. In this sense we assumed that the organizations took decisions and that they knew how to do so. After expressing our ideas, needs and requirements, we passively expected that the organizations would meet our requests. We did not have an active position in implementing actions" (Owner of Firm 2).

"We know that ANDIBOL does not belong to us, however we have had to act as leaders and sometimes to take decisions in our own because the passive participation of other members" (R&D organization representative).

When these matters were discussed with farmers in the focus group session, it was clear that farmers limited their participation in the decision making process associated with the implementation of the InnovAndes project. The following statement exemplifies this aspect:

"All the activities we do with the project are decided together with the engineers [staff of the R&D organization and local NGO], and most importantly we evaluate whether that we do works and is useful" (Farmer participating in the focus group session).

When farmers were asked about decisions associated with their relationships with the participating firms in the platform, they asserted that:

"During the meetings the entrepreneurs (firms' owners) tell us their requirements for products. After that we do not know how they decide whether or not they will buy our products. We just receive the information from the engineers [Staff of the R&D organization and Local NGO]" (Farmer participating in the focus group session).

"For our part, we also decide whether we prefer to sell to the entrepreneurs or instead to other clients" (Farmer participating in the focus group session).

The evidence so far suggests that the divergences between members regarding whether the decisions made within ANDIBOL corresponded to the interests of all or instead just to some of its members, were a consequence of: i) the weakness or the absence of relationships of coordination and information exchange between members with different visions about the rationale of ANDIBOL's existence, objective and functions; and ii) how the R&D organization acted simultaneously as facilitator and as implementer of the InnovAndes project.

Regarding the first point, it seems that after three years of operation no shared vision articulating members' different visions about the objective and functions of the platform was built. Consequently it seems that the divergences discussed in this sub-section, rather than referring to the interests involved in the decisions made within ANDIBOL, corresponded instead to different perceptions about what vision prevailed in the orientation of the decisions.

For instance, according to the point of view of the owners of the participating food processing firms, the decisions made in ANDIBOL did not correspond to the objective of the platform, in other words, to promote and facilitate the realization of socially responsible business. They asserted that, on the contrary, decisions were oriented toward the achievement of the objectives of the project, which in turn embodied the interests of the farmers and the supporting organizations. By contrast, there was a tendency among supporting organizations in affirming that the decisions taken in ANDIBOL mainly represented the interests of the firms. They asserted that the statement of the objectives of the platform was strongly influenced by the perspectives of the firms without considering sufficiently the interests and reality of the farmers. Furthermore, they considered that the

agenda of discussion of ANDIBOL's meetings was mainly directed to treating themes associated with the realization of business and almost always trying to satisfy the requirements of the firms.

In relation to the second point, that is, how the R&D organization acted simultaneously as facilitator and as implementer of the InnovAndes project, the evidence suggests that the R&D organization confronted a dilemma in balancing its own vision about the objective and functions of ANDIBOL with its role of project implementing partner and facilitator of the platform. On the one hand, the development of strong and permanent relationships of coordination and information exchange with farmers and the Local NGO around issues associated with the implementation of the project, and the weakness of their relationships with the other participating actors (especially with firms), seem to indicate that the role of project implementer prevailed over the role of facilitator. On the other hand, according to the evidence, it seems that the R&D organization, having a key position in both the project and the platform, exercised a certain level of influence in guiding the operation of both the platform and the project as instruments to foster agricultural innovation and business development in favour of the farmers.

The discussion so far has presented evidence about how ANDIBOL´s members built different views regarding the objective and functions of the platform according to their interests, and tradition of working and thinking. Then the discussion highlighted the influence of these different ways of looking at the platform on the structure of relationships of coordination and information exchange between members, the patterns of participation of each members, and finally on the decision making processes within ANDIBOL and the role of facilitation performed by the R&D organization. The next sub-section moves on to discuss the implications for what ANDIBOL´s members called the internal management of the platform.

5.4.4 ANDIBOL internal management

To discuss the implications of the findings above, a workshop using participatory research techniques (see Chapter 3) was carried out with all ANDIBOL´s members: owners of the three firms and of the Company Specializing on Foreign Trade Logistics, representatives of the R&D organization, local NGO and International Foundation, as well as representatives of the farmers organization member of the Platform. The following summarizes and discusses the results of the workshop

After a presentation of the evidence discussed above by the researcher, participants identified managerial failures undermining the development of concrete actions that respond to the interests of all the members. The data provided was then grouped by the participants into three categories of failures, although these categories overlap and failures within one category can be the cause of or reinforce failures in another. They are: a) lack of procedures, b) failures of communication and information exchange, c) and lack of capacities to work as a network.

According to the data, participants agreed that the platform lacked formally defined procedures to capture and articulate different needs and ideas of innovation, to decide which are the most important, which to prioritise, whether they are within the capabilities of the platform, and whether they correspond to the objective and functions of the platform. They also considered that the platform lacked procedures for planning and monitoring action, and to assigning responsibilities.

This can be illustrated by the assertions provided by the participants in the workshop:

"I think we need to be more systematic in prioritizing demands. We do not have a well defined procedure to do so. In fact, what is happening is that we prioritize demands as they appear and not strategically" (Representative of the International Foundation).

"We do not have a formal and simple way to know what the demands of farmers and firms really are. I am referring to both innovation needs and demands for products" (Owner of Firm 2).

"We always want to satisfy the requirements of our clients [firms in the platform], but sometimes is difficult to organize the production of all our companions [member of the farmer organization participating in ANDIBOL], and sometimes we do not know the demands of the firms" (President of the farmers' organization).

"Although we have experience in applying participatory methods to identify farmers' demands and to monitoring development projects, we do not have the same experience, tools and procedures to work with firms" (Representative of the R&D organization).

According to the data, failures of communication and information exchange were identified by the participants as a direct consequence of the existence of the structural hole in the relationships between members. This is the lack of connectedness between firms and farmers and the position of the facilitator as a "one way bridge" between members.

As observed by the participants in the workshop:

"I consider that in order to develop business, firms and farmers need to interact and exchange information directly. Here in the platform we do not have, or we have not developed, tools to exchange information and this is why the supporting organizations are always in the middle" (Owner of Firm 1).

"All the information passes through the supporting organizations and we have the meetings as the only moment in which we share and analyse this information. I think that this one of the reasons why there are no strong relationships between firms, and between firms and farmers. All the relations are mediated by the supporting organizations" (Representative of the International Foundation).

"We actually know very few about the firms. What we know is what the engineers [staff of the R&D organization and Local NGO] tell us about them. It will be great if we can contact with firms mere directly" (Vice-president of the farmers' organization).

For all the members, ANDIBOL represented the first experience of being part of an initiative aimed at bringing farmers, firms and supporting organizations together. As such it challenged their way of thinking and working, and their capacities, including those of the R&D organization. Since ANDIBOL was driven and facilitated by the R&D organization, the skills and experience of this organization were strongly influential both in the structuring of relationships and in the operation of the platform. Members noted that the identification and prioritization of needs, the definition of actions and monitoring, were based on the capacities of the R&D organization. However they said that, because the experience of this type of organization focuses on working with farmers around issues of technological research and development, the R&D organization's capabilities were not suitable or sufficient either to work with firms and markets or to facilitate the relations between farmers and firms.

The following statements exemplify this point:

"Supporting organizations have diverse knowledge; experience and ability to work with farmers, but in contrast they lack skills to work with firms and marked related issues" (Owner of Firm 1).

"We think that all things in the platform have been done based on the capabilities of the supporting organizations. We have not found the way to take advantage of other capacities present in the platform, and we have not been able to translate our decisions into concrete actions" (Owner of the Company specializing in foreign trade logistics).

Around these three categories of managerial failures, participants in the workshops were asked to identify the major effects on the development of businesses and on the

generation of innovation; the two functions with which ANDIBOL came into life as discussed in Section 5.2. Table 5.9 summarizes the data generated through a brainstorming exercise at the workshop.

Table 5.9 ANDIBOL's managerial failures

Business development	Generation of innovation
1. Lack of direct commercial relations between farmers and firms 2. The reduced number of farmer organizations and firms participating in the platform limits the possibility of developing business (few demanders and few suppliers) 3. Lack of clarity in the definition of responsibilities 4. Lack of procedures and inefficient management of information on demands and supply of products 5. Lack of procedures and inefficient management of information on monitoring and evaluating actions	1. Poor involvement of firms in innovations actions related with productive aspects in the field of farmers, and vice-versa, poor involvement of farmers in innovation actions in post harvest, processing and marketing. 2. Lack of direct relationships between farmers and firms 3. The reduced number of services providers participating in the platform limits the supply of innovation services 4. Lack of procedures and inefficient management of information on innovation needs and supply of services 5. Lack of procedures clearly and formally defined to capture and prioritize innovation needs, and for defining and monitoring innovation actions 6. Lack of procedures and inefficient management of information on monitoring and evaluating actions

Almost all the failures listed in Table 5.9 relates to the absence of procedures for business development and innovation. The evidence discussed throughout the chapter indicates that this resulted from or was a consequence of ANDIBOL members' different views about the objectives and functions of the platform (Section 5.3); the lack of connectedness between farmers and firms, and the position of the R&D organization as a "one way bridge" between members (Sub-section 5.4.1); and the engagement of the R&D organization, Local NGOs and farmers in the implementation of the InnovAndes project (Sub-section 5.4.3). Thus, according to the conceptual framework in Chapter 2, the institutional innovation process of ANDIBOL formation and operation did not result in the development and operation of shared rules and procedures enabling heterogeneous players to act collectively in pursuing of shared interests. This aspect will be discussed from a theoretical perspective in Chapter 7.

5.5 Conclusions

In the light of evidence discussed throughout the chapter, conclusions regarding whether ANDIBOL evolved as proposed by the Papa Andina Model and the InnovAndes Project, in correspondence with or in contradiction to ANDIBOL members' understanding and expectations, as well as conclusions about the factors influencing such evolution are offered in this section.

The general finding was that ANDIBOL did not take place and operate as proposed by the Papa Andina Model, neither in correspondence with members' different expectations. The first point of departure from the model was introduced in the design of the InnovAndes Project. Then, how ANDIBOL evolved depended on the extent to which the project's contents corresponded to the attributes (values, interests, and tradition of thinking and working) of the participants and on how each member constructed its own understanding and expectation about the platform as it related to and interacted with the other participants.

The evidence discussed in this chapter shows that the design of the project changed one of the critical conceptual elements of the model and introduced another element not defined in the model, that ultimately were decisive in the evolution of ANDIBOL. The first refers to the conversion of the platform's conceptual functions into services aimed at helping farmers in accessing technical services and profitable markets. The second element corresponds to the assignment of roles and positions to certain types of actors both within the project and within the platform: the R&D organization, the Local NGO and the farmers.

The evidence shows that despite the initial consensus between members in situating the facilitation of business development as the central element of the objective of ANDIBOL, three years after of the formation of the platform, antagonisms between members appeared

regarding whether the platform should be considered as a pro-poor development initiative, and whether the promotion of innovation should be considered as a "farmers' needs" or as a "business realization" driven process; and therefore, whether the promotion of innovation and the facilitation of business realization should be considered as an objective or as a function of the platform. The evidence shows that underlying these differences were the expectations that each member had about the benefit that they might receive from participating in the platform, and their different traditions of thinking and working.

The evidence indicates that how each member built its own understanding about the objective and function of the platform, about its own role and the role of others, was affected by how the relationships of coordination and information exchange between members were structured. According to the evidence the R&D organization, acting both as facilitator of the platform and as project implementing partner, played a central role in this matter. In correspondence with its tradition of supporting farmers through R&D projects, it prioritized the formation of strong and permanent relationships with farmers and the Local NGO around issues associated with the implementation of the project, giving less emphasis to its relationships with other members and to the facilitation of relationships between the participating actors in the platform.

These patterns of the relationships between members in turn influenced the patterns of participation and members' different perceptions regarding whether the decisions made in ANDIBOL represented the interests of all or only the interest of some. Regarding this last point, the evidence suggests that after three years of operation no shared vision articulating members' different visions about the objective and functions of the platform was built. Consequently it seems that the divergences, rather than referring to what interests were involved in decisions, corresponded to different perceptions about what vision prevailed in the orientation of the decisions.

All these aspects resulted in failures in the internal management of ANDIBOL. As expressed by members these failures undermined ANDIBOL´s capability to develop concrete actions satisfying the interests of all. According to the evidence, the major failures corresponded to a lack of procedures to articulate members´ different demands for products and innovation needs, failures of communication and information exchange, and a lack of capacities to work as a network.

Putting all these findings in the theoretical perspective offered by the conceptual framework discussed in Chapter 2, the conclusion is that the institutional innovation process of formation and operation of ANDIBOL was strongly influenced by the interaction between the definitions contained in the InnovAndes Project design and the heterogeneity of attributes of the participating actors, and by how and by who the role of facilitation was performed. A theoretical discussion of these conclusions is offered in Chapter 7.

Chapter 6 Building multi-stakeholder platforms to foster poor farmers' needs driven innovation: the CD-PIC and Local Platforms case

6.1 Introduction

This chapter discusses the Continuous Innovation Model of multi-stakeholder platforms, as a proposal of new forms of multi-organizational collaboration to foster poor farmers' needs driven innovation in the Bolivian agricultural sector. The model was put into practice through the Continuous Innovation Programme, and used to drive the institutional innovation process that gave rise to the formation and operation of the CD-PIC and the Native Potatoes and Peach Local Platforms.

This chapter follows the same line of analysis and structure of Chapter 5. As such, the discussion focuses on:

i. how over time the different participants in the departmental and Local Platforms built their own understandings and expectations about the platforms;

ii. how different understandings and expectations corresponded to, were affected by, or shaped in practice the critical conceptual components of the Continuous Innovation Model and the definitions contained in the Continuous Innovation Programme design; and finally,

iii. how the operation of the platforms was differently perceived by the participants in line with or in contradiction to their understandings and expectations.

The analysis in Section 6.2 is aimed at identifying whether the purpose, composition, functions, and members' role and positions of the platforms corresponded to the model's and programme's guidelines, and the extent to which they were adopted or shaped in practice by the actors involved in the formation of the platform. After that, Section 6.3 discusses platform members' views about the platforms' objectives, functions and

members' roles, in this case, nearly two years after their formation (whereas in the ANDIBOL case, it was after three years).

As discussed in Chapter 3 and as carried out in the ANDIBOL case, Section 6.4 presents and discusses evidence on platform members' views about the different dimensions that, according to the participants, were the dimensions through which the operation of the CD-PIC and PIC Local Platforms could be researched in-depth. The dimensions are:

- CD-PIC and Local Platforms fulfilment of functions (Sub-section 6.4.1)
- CD-PIC decision making process (Sub-section 6.4.2)
- CD-PIC mechanism of participation (Sub-section 6.4.3)
- The role of facilitation within the CD-PIC and Local Platforms (Sub–section 6.4.4)

There are differences and similarities between the operational dimensions listed above and dimensions studied in the ANDIBOL case. An explanation of how these differences were handled to allow a comparative discussion between the two cases is offered at the beginning of Section 6.4.

Finally, in the light of evidence discussed throughout the chapter, in Section 6.5, conclusions are offered regarding:

i. whether the CD-PIC and Local Platforms evolved as proposed by the Continuous Innovation Model and the Continuous Innovation Programme;

ii. in correspondence with or in contradiction to platforms members' understanding and expectations; and

iii. about the factors influencing such evolution.

The general finding was that although the CD-PIC and Local Platforms were implemented in line with both the Continuous Innovation Model and the Continuous Innovation Programme guidelines, it was the programme which actually influenced how the platforms operated and evolved, including the patterns of relationships and information exchange between members, the decision making process, the working procedures, the mechanisms of participation, and the role of facilitation.

6.2 Putting the Continuous Innovation Model and the Continuous Innovation Programme into practice

This section discusses evidence about the extent to which the purpose, composition, functions, and members' role and positions with which the CD-PIC and Local Platforms came to life corresponded with the model's and programme's guidelines, and the extent to which they were adopted or shaped in practice by the actors involved in the formation of the platforms.

The Continuous Innovations Model assumes farmers' needs or the solution of farmer's technological constraints as the trigger for innovation, therefore the process of innovation has to permit such constraints to be overcome. Correspondingly, the model proposes a set of conceptual guidelines in relation to how a multi-stakeholder platform at departmental and local level should be composed, what functions it should perform and about the nature of the rules guiding its operation.

According to the model, platforms at the local level are conceptualized mainly as composed by farmers, public and private research and technology transfer organizations, and local governments. At this level the solution of farmers' technical constraints and/or the satisfaction of their needs mainly lie in the articulation of demand and supply of technology, and the actors called to participate are demanders and suppliers of research and technology transfer services. Therefore, Local Platforms should accomplish the function of

improving coordination and governance in the articulation of technological demand and supply. According to this function, Local Platforms are expected to be used as a space where farmers and other local actors meet research and technology transfer organizations, express their needs and demands, take decisions regarding the selection of the best offer of research and technology transfer services, and finally evaluate whether the results of the provision of services are satisfactory or not.

Regarding the departmental level, as outlined in Chapter 4, the model suggests that platforms ought to include the participation of representatives of public and private universities, representatives of the departmental government and governmental development agencies, public and private R&D organizations, chambers of private entrepreneurs, unions or associations of agricultural producers, among others. With this composition, departmental platforms are expected to be a space enabling coordination between actors with different innovation visions to set up departmental agricultural innovation priorities. According to the model's principle of bottom–up innovation outlined in Chapter 4, it is expected that these priorities should be defined considering simultaneously technological needs and constraints at the local level, and departmental development priorities and policies.

In correspondence with these functions, the Continuous Innovation Model provides guidelines in relation to the nature of the rules governing participating actors' roles, behaviour, contribution, and interactions at both levels. At the local level rules and procedures are expected to reduce the transaction costs that farmers and other local actors confront in accessing information about research and technology transfer supply and about the corresponding providers; and also to reduce the transaction costs that the identification, prioritization and expression of demands for technology imply. From the perspective of research and technology transfer service providers, rules and procedures should be those reducing the transaction costs that these organizations face in accessing information about

farmers' demands, and consequently in adjusting their services in order to better serve those demands. Additionally, rules are expected to be those allowing farmers and service providers to jointly monitor and evaluate, effectively and on a continuous basis, the extent to which research and technology transfer results satisfy farmers' demands. According to the literature on innovation brokers discussed in Chapter 2, the rules and procedures proposed by the Continuous Innovation Model for the platforms at local level correspond, at least conceptually, to the functions of demand articulation and innovation processes management (Klerkx and Leeuwis, 2009; Klerkx et al, 2009b). The first function includes the articulation of different innovation needs and corresponding demands in terms of technology, and the second includes the development of working procedures, such as procedures for monitoring and evaluation.

Finally, according to the Continuous Innovation Model, rules and procedures at departmental level are expected to be those permitting the process of setting up departmental agricultural innovation priorities articulating participating actors' different innovation visions, and reducing the transaction costs that this process implies in terms of accessing and producing information, and negotiating priorities. As at the local level, rules and procedures at departmental level are in line with the function of demand articulation in terms of the articulation of different innovation visions, and to the function of innovation processes management in terms of information sharing, and alignment among different actors around shared priorities.

The discussion turns now to the correspondence between the Continuous Innovation Programme and the model regarding the platforms' composition, functions and members' roles and position. Table 6.1 summarises the data in this respect.

Table 6.1 Differences between the guidelines provided by the Continuous Innovation Model and the Continuous Innovation Programme design

Guidelines regarding	The Continuous Innovation Model	The Continuous Innovation Programme
Platform's composition	Departmental platform: Representatives of public and private universities, representatives of the departmental government or of governmental development agencies, public and private R&D organizations, chambers or associations of small and medium industries, unions or associations of agricultural producers, among others. Local Platforms: Representatives of farmer organizations, local government (municipality), R&D organization and other service providers, whether public or private providers.	Departmental platform: Representatives of public and private universities, representatives of the departmental government or of governmental development agencies, public and private R&D organizations, chambers or associations of small and medium industries, unions or associations of agricultural producers, among others. Local Platforms: Representatives of farmer organizations, local government (municipality), R&D organization and other service providers, whether public or private providers.
Platform's functions	Departmental platform: Formulating agricultural research and technology transfer priorities in correspondence with departmental development priorities and policies. Strengthening the articulation between demanders and providers of research and technology transfer services in order to better respond farmers' technological needs. Local Platforms: Articulating local actors' demands for agricultural research and technology transfer with their corresponding supply.	Departmental platform: Managing strategically, technically and administratively the competitive bidding process for allocating agricultural research and technology transfer projects in response to Local Platforms' mandates. Local Platforms: formulating demands for agricultural research and technology transfer toward the competitive bidding process for the allocation of projects; and monitoring and evaluating the extent to which projects satisfy such demands.
The role of the facilitating agent	No guidelines in this regard	Supporting the operation of local and departmental platforms and the articulation between both levels At departmental level: providing information, facilitating relationships with relevant organizations in the environment, and organizing forums for discussion At local level: encouraging local actor articulation and interaction, and strengthening local capacities to manage research and technology transfer projects

Different from the InnovAndes Project, where the platform's functions (as defined in the Papa Andina Model) were converted into something resembling services aimed at helping farmers in accessing technical support and profitable markets, the Continuous Innovation Programme established the type of process that platforms at departmental and local levels

should follow in performing their functions: the competitive bidding process for allocating research and technology transfer projects.

Although the bidding process (whose characteristics were outlined in Chapter 4) can be seen as the mechanism employed by the programme to put into practice the guidelines provided by the model, some critical conceptual elements of the platforms' functions were lost or at least hidden in the programme design. In this regard, while the articulation and alignment of different visions about departmental innovation priorities and the articulation of local actors' innovation needs with their corresponding supply are central to the model's definition of functions, the programme limited the functions of the platforms to the implementation of the bidding process for allocating projects. Such functions include, for example: managing strategically, technically and administratively the process, formulating research and technology transfer demands, implementing research and technology transfer projects to satisfy them, and monitoring and evaluating projects. It is argued that these functions correspond more to the management and implementation of R&D projects, rather to the functions of demand articulation, network formation and innovation process management, at least as defined in the literature on innovation brokers discussed in Chapter 2. Summarising, it seems that the inclusion of the bidding process for allocating projects in the programme design, was the main point of departure from the model, and gave rise to other differences, including differences in guidelines regarding platforms functions, and roles and positions of the participating actors, as showed in Table 6.1.

The discussion turns now to how the guidelines in the Continuous Innovation Model and in the Continuous Innovation Programme design were put into practice when the CD-PIC and the Local Platforms were formed. The composition, objectives and functions with which the platforms came to life have been outlined in Chapter 4. However, to what extent did these dimensions correspond to the guidelines of the model and the programme design?

As showed in Chapter 4, according to its internal regulation, the CD-PIC was created both as a body of technical and administrative direction of the programme and as a body of strategic orientation of agricultural innovation processes at departmental level. On the one hand, as a body of technical and administrative direction its functions were defined in line with the implementation of the bidding process for allocating projects, as it was established in the programme design (see the left hand column of Table 4.5 in Chapter 4). On the other hand, as a body of strategic orientation of agricultural innovation processes, the CD-PIC was expected to promote all types of organizational synergies and complementarities with relevant organizations to contribute to the analysis and setting of agricultural innovation priorities and programmes in correspondence with departmental policies and development priorities (see the right hand column of Table 4.5 in Chapter 4). As such, these functions were defined in accordance with the Continuous Innovation Model's guidelines. Also according to the CD-PIC's internal regulations, the functions of the Local Platforms were defined according to the design of the programme; local actors were assigned the role of formulating research and technology transfer mandates, and monitoring and evaluating the extent to which these projects satisfied their needs.

Finally, to support the operation of local and departmental platforms and the articulation between both levels, the design of the programme included the presence of a technical team with the responsibility of facilitating the implementation of the programme at local and departmental level. This team came to life as the Technical Secretariat and its functions were defined in correspondence with the functions of the CD-PIC and Local Platforms (see Table 4.6 in Chapter 4).

The discussion so far shows that despite differences between the model and the programme design, the CD-PIC and Local Platforms started up with functions that corresponded to both. Evidence on whether these functions were antagonist or complementary, the extent to which they corresponded to the participants' expectations, and whether or not they were

a source of conflict and tension between participants is analysed in the remaining sections of this chapter.

6.3 CD-PIC and Local Platforms members' perceptions about the objectives and functions of the platforms

This section discusses CD-PIC's and Local Platforms members' views about the objectives and functions of the platforms nearly two years after the platforms were formed. As outlined in Chapter 3, CD-PIC members' views were captured through individual interviews and Local Platforms members' views through focus groups.

According to the evidence collected through the interviews with each of the 8 CD-PIC[6] members, interviewees agreed that within the Departmental Council of Competitiveness of Cochabamba (CDC)[7] technical innovation was always seen as a key factor for productivity, competitiveness and development. However, they recognized that, before the formation of the CD-PIC, the CDC lacked a specific committee to systematically handle issues related to innovation. In this sense, all the interviewees perceived that although the CD-PIC was created only to address issues associated with innovation for the agricultural sector, the experience of building a model of coordination and cooperation between different organizations could be followed by the CDC to foster innovation in other sectors. The statement provided by the representative of one of the two R&D organizations participating in the CD-PIC illustrates this idea:

"Inside the CD-PIC we are trying to build a new form of collaboration and coordination between organizations to foster innovation for the agricultural sector. It is a new

[6] Table 4.3 in Chapter 4 details the composition of the CD-PIC. It includes representatives from two private R&D organizations, one public university, two private universities, representative from the Departmental Government, Chamber of Private Entrepreneurs, and from the Small and Medium Private Firms Federation.

[7] As outlined in Chapter 4, COSUDE and the Departmental Council of Competitiveness of Cochabamba (CDC, for its Spanish acronym) signed an agreement for the council to take over the technical and administrative management of the Continuous Innovation Programme (CDC, 2009; CDC 2010). The CDC is a nonprofit civil society organization that seeks to promote organizational coordination and collaboration to improve productivity and competitiveness in a variety of economic activities in the department of Cochabamba. All the CD-PIC members are at the same time members of the CDC.

experience. The opportunity has been offered by the programme which proposes an interesting model that needs to be tested and adjusted to our conditions and then used in other sectors. In fact, it is the first time that the CDC receives technical and financial support to do this kind of thing" (Private R&D organization 2's representative).

As discussed in Chapter 3, interviews sought to explore how each CD-PIC member had built their own understanding and expectations about the objectives and functions of the platform after two years of operation. The data gathered showed that members' understanding about the objectives or about the rationale of the CD-PIC's existence corresponded in many sense to the critical elements of the Continuous Innovation Model and also to the conceptual definition of the functions of demand articulation and innovation processes management discussed in Chapter 2 (Klerkx and Leeuwis, 2009; Klerkx et al, 2009a). For example, the idea of aligning actors' different visions and knowledge, was highlighted by the representative of the public university and by the representative of the departmental government, who asserted that:

"More than as a traditional project directorate, I see the CD-PIC as a network where various organizations with complementary capabilities and knowledge meet together to share ideas and define research and technology transfer projects that better respond to farmers' needs and to see whether these efforts at local level correspond and contribute to departmental development priorities. In this sense, the CD-PIC is a meeting place for capacities, knowledge and visions" (Public University's representative).

"The CD-PIC is an organizational experiment to foster agricultural innovation, whose major challenge is to articulate the interests of the multiple actors involved in the agricultural sector in correspondence with departmental development priorities" (Departmental Government's representative).

Also the idea of building different schemes of coordination and collaboration referred to in the literature as part of the function of network formation was highlighted by the interviewees as follows:

"Within the CDC is the first time that we discuss about research and technology transfer for the agricultural sector. This committee [the CD-PIC], gives us the opportunity to collaborate and coordinate with other organizations, to know what they are doing and what we can do together" (Public University representative).

"As an organization dealing with agricultural development and technology, being part of the CD-PIC offers the possibility to make alliances with other organizations to increase our capabilities to give satisfactions to farmers' needs" (Private R&D organization 1's representative).

The evidence discussed so far, suggests that members conceptualized the CD-PIC as a space where different organizations collaborate and coordinate to generate a shared vision about the main innovation needs in the agricultural sector, and about the best way to satisfy them taking advantage of the diversity of capacities in the committee. This vision was in line with the Continuous Innovation Model which proposes departmental platforms as spaces enabling coordination between actors with different innovation visions to set up departmental agricultural innovation priorities (Section 6.2), and in correspondence whit the functions of the CD-PIC as a body of strategic orientation of agricultural innovation in Cochabamba (Table 4.5 in Chapter 4). Notably, none of the statements above made reference to the CD-PIC as a body of technical and administrative direction of the Continuous Innovation Programme, although this type of responsibility was included in the design of the programme (Table 6.1) and in the CD-PIC's internal regulations when it started (Table 4.5 in Chapter 4).

Another relevant aspect in how the interviewees conceptualized the CD-PIC relates to the heterogeneity of its composition. The above statements suggest that the diversity of visions, knowledge and capacities among the members was considered a strength in defining agricultural innovation priorities, research and technology transfer projects that better respond to farmers' needs, and to increase members' capabilities. This way of considering heterogeneity corresponds to the holistic perspective on innovation in the innovation systems approach, discussed in Chapter 2 (van Kerkhoff and Lebel, 2006).

After discussing with the interviewees their view about the objectives of the CD-PIC, individual interviews moved on to explore each member view about the functions of the platform. The data collected suggests that there was a consensus among the interviewees in agreeing that agricultural innovation processes should be driven by, and respond to, farmers' technological needs, and also in agreeing that the articulation of local actors' technological needs with the supply of research and technology transfer services was the main function of the CD-PIC. Differently from the ANDIBOL case, where members diverged about whether business realization or pro-poor innovation should be the core business of ANDIBOL, there were no discrepancies between CD-PIC members in identifying the main function of the platform. The following observations illustrate this point:

"Research in agricultural technologies and therefore the organizations that provide this service should guide their work according to the requirements of farmers. This is precisely what we are trying to do in the CD-PIC through the project [the Programme]: connecting local actors' technological mandates [Local Platforms' mandates] with organizations that have the greatest capacity to implement projects that meet these requirements" (Small and Medium Private Firms Federation's representative).

"During the last two years we have made decisions on the best way to invest the resources provided by the programme [the Programme] in order to respond to Local Platforms' mandates. The CD-PIC, working as a network and considering the knowledge and experience of all its members, took decisions about what projects should be conducted and what research service providers should implement them" (Private University 2's representative).

"Responding to the needs of farmers often involves the collaboration between organizations with different and complementary capabilities. Through the competitive process of allocation of agricultural research and technology transfer projects we [the CD-PIC] try to stimulate the formation of partnerships between private and public service providers for the implementation of these projects" (Private R&D organization 2's representative).

From these it seems that the CD-PIC, in managing the competitive bidding process for allocating projects, acted more as a project directorate rather than as a departmental platform of the nature and with the functions suggested by the model. The evidence showed that decisions taken by the CD-PIC about what research and technology transfer projects should be implemented, what service providers had the greatest capacity to satisfy local actors' demands, as well as decisions about the best way to invest the programme's resources, related more to the technical and administrative implementation of the programme, rather than to the articulation of members' different visions and needs regarding innovation priorities. This aspect seems to indicate a certain distance between how the CD-PIC members conceptualized the objectives of the platform and how they actually operated.

To explore the implications of the above difference (between how the CD-PIC members conceptualized the objectives of the platform and how they actually operated),

interviewees were asked for their opinion about whether the functions of direction of the programme and the functions of strategic orientation of agricultural innovation processes in Cochabamba were antagonistic or complementary, and whether they were a source of conflict and tension between participants. A common element in all the answers was that the implementation of the bidding process for allocating projects, according to the programme design and in correspondence with the CD-PIC's functions as a body of direction of the programme, had absorbed almost all the attention and efforts since the platform was formed. Respondents also agreed in observing that the CD-PIC had been not dynamic, capable and engaged in accomplishing its strategic functions. However, differences arose among the interviewees in assessing this situation. For example, some respondents observed that although the implementation of the programme had received more attention, the challenge ahead should be to address their strategic function taking advantage of the heterogeneous composition of the platform. This view seems to indicate that some CD-PIC members considered both functions (directive and strategic functions) complementary or independent, but not as antagonistic. The statements below exemplify this point:

"Until now we work directing the implementation of the programme. However the heterogeneity of the CD-PIC's composition gives the possibility to see agricultural research and technology transfer from a variety of perspectives in order to contribute to departmental development. This introduces a major change in the traditional way of seeing agricultural innovation as a field in which only research organizations have a role. However, this potential has not been exploited yet" (Private University 2's representative).

"Until now we [the CD-PIC] worked managing and taking decisions regarding the implementation of the project [the Programme]. This is only one of the branches of our functions. However, we also have to act [the CD-PIC] as a space where multiple actors with multiple visions and capacities come together to reflect and coordinate priorities,

common objectives, and common actions in favor of the competitiveness and productivity of the agricultural sector" (Chamber of Private Entrepreneurs representative).

Conversely, other respondents considered that the focus on managing the implementation of the programme as a project directorate did not correspond to the rationale of the CD-PIC's existence. The statements below point out that the implementation of the programme responded to the compliance with the contract between the CDC and COSUDE[8] and was therefore valid only for the duration of the programme. Accordingly, it seems that the interviewees supporting this view considered that the functions associated with the strategic orientation of innovation process in Cochabamba, rather than the direction of the programme, were central to the objectives with which the platform was formed.

"Until now we did not take advantage of, or we did not use, the diversity of capacities, experience, and knowledge of the organizations represented in the committee to discuss and propose departmental agricultural innovation priorities. So far we have concentrated on directing the project as if we were a traditional directorate. However, this does not correspond to our true function: if we are a project directorate, what will happen when the programme ends? The committee will stop working?" (Private R&D organization 1's representative).

"The last two years we concentrated on the implementation of the programme, probably due to the pressure we have to comply with the contract signed between COSUDE and the CDC for the implementation of the programme. But our mission goes beyond the programme: we have to contribute to the development of the agricultural sector by proposing innovation priorities, articulating different needs and facilitating the coordination between the organizations involved in agriculture" (Private University 1's representative).

[8] See foot note 7

Differently from the ANDIBOL case, where different visions about whether the platform should be a space for promoting innovation processes in response to poor farmers' needs or to foster and facilitate the development of equitable businesses between farmers and firms, the differences between the CD-PIC members related to different levels of concern about the different degree of progress achieved in performing directive and strategic functions rather than different visions about the objectives of the platform. In other words, they were concerned with how the CD-PIC actually operated. The evidence suggests that the operation was strongly influenced by the Continuous Innovation Programme design and by the fact that the CD-PIC was organized in practice as an operational structure for the implementation of the programme (see Figure 4.1 in Chapter 4) in which each member adopted the position of director with competences to evaluate, approve and take decisions about the overall implementation of the bidding process for the allocation of projects. This aspect will be discussed in-depth in Section 6.4.

The discussion so far has focused on the CD-PIC's objectives and functions viewed from the perspective of its members. This section moves now on to discuss local actors' views regarding the objectives and functions of the Local Platforms. As outlined in Chapter 3, data was gathered through a focus group held with each Local Platform.

During the focus group sessions participants were asked to identify and prioritize the functions of the local platform in which they were involved. Functions were identified through brainstorming and then prioritized, asking each participant to vote for those considered the most important. Differently from the ANDIBOL case, where focus group sessions were carried out through semi-structured group discussion with individuals with similar backgrounds (communal authorities), in the case of the Native Potatoes and Peach Local Platforms, brainstorming and a voting exercise were used to give participants with different cultural and social background an equal opportunity to express their views (see Chapter 3). Table 6.2 summarizes the information collected.

Table 6.2 Local platform members' views about the functions of the platform

Native Potatoes Local Platform					
Number of participants in the focus group session: 6 Possible number of votes per participant: 5[1] Possible number of votes: 30					
Functions	**Voting results**				
	1st	**2nd**	**3rd**	**4th**	**5th**
Identifying and prioritizing our demands	11				
Coordinating the work of the different projects and organizations that act in our communities			6		
Negotiating with local governments and other organizations				2	
Strengthening farmers' organizations				2	
Control the implementation of projects		9			

Peach Local Platform						
Number of participants in the focus group session: 8 Possible number of votes per participant: 6[1] Possible number of votes: 48						
Functions	**Voting results**					
	1st	**2nd**	**3rd**	**4th**	**5th**	**6th**
Identifying and prioritizing the problems we have in producing and selling our products		8				
Interacting with the various institutions (research and technology transfer service providers) that implement projects in our territory	12					
Unifying the various associations of producers and engaging municipal governments in matters that have to do with the production				6		
Evaluating the implementation of projects			7			
Analyzing the activities that we have to do to increase the production and commercialization of our products		8				
Promoting the result of the project to reach the largest number of producers			7			

[1] Participants could vote for one alternative more than once

After voting the participants were asked to comment on the results. Comments suggested that the platforms' functions identified as most important related to each other. For example, participants in the focus group session held with members of the Native Potatoes Platform explained that:

"Participating in the platform, we are strengthening our association because we have the possibility to express our demands directly to the institutions [Research and technology transfer service providers], to see what they are doing, what they can offer to help us, and

most important to control that the projects are in our benefit" (Representative of producers' association. Native Potatoes Local Platform).

"As we have more opportunities to coordinate with other institutions and local authorities, we also have more pressures to respond efficiently to producers' demands because they have the possibility to exercise control over the projects. This is good because we gain farmers' commitment, but at the same time we have to manage this aspect very carefully because on many occasions farmers expect results that we are not able to offer, at least in the short term when we are implementing research projects" (Representative of R&D organization. Native Potatoes Local Platform).

For their part, members of the Peach Local Platform noted that:

"Is the first time that we have a place in which producers, institutions [research and technology transfer service providers] and municipal authorities interact and discuss production problems and demands for technology" (Representative of producers' association. Peach Local Platform).

"The platform is a good space to interact and coordinate with other research organizations and services providers, and also to engage municipal government and commitment in the projects. On the other hand, we have the possibility to capture farmers' needs and opinions, to adjust our research and technology offerings, and to improve the implementation of the project that we are operating. Sometimes this is difficult because farmers ask for things that we cannot do or accept, at least with the budget of the projects that we are currently implementing" (Representative of R&D organization. Peach Local Platform).

"We support the platform because on it we can coordinate with the various institutions working in our territory. We can see what they are doing, how they can articulate and contribute to our strategies of productive development, and see the activities that we can

do together to benefit the largest number of producers. In this sense the participation of farmers in the platform is very important to discuss their problems and needs and how we can support them" (Local government's representative. Peach Local Platform).

The data in Table 6.2 and the statements above show that members of both Local Platforms identified functions that corresponded to both the model and the programme design. Functions associated with the coordination, interaction and negotiation between farmer, service providers and local authorities, as well as the exchange of information on demands for and supply of technology, relate closely to the functions proposed in the model. For their part, identifying and prioritizing demands, as well as evaluating the implementation of projects, are functions in line with the design of the programme. However, the results of the voting exercise showed differences between both platforms regarding what type of functions were identified as most important. While the members of the Peach Local Platform assigned almost equal priority to functions associated with the model to those related to the programme, functions in line with the implementation of the programme received more votes from the members of the Native Potatoes Platform participating in the focus group session. Probably these differences resulted from differences in the composition of each local platform (see Table 4.4 in Chapter 4), which in turn was reflected in the list of participants in each focus group session. While in the case of the Native Potatoes Local Platform the focus group session was held with three representatives of farmers, one of the local government, and two of R&D organizations, the focus group session in the case of the Peach Local Platform had the participation of a higher number of people who were not farmers; it was held with three representatives of farmers, three of the local governments, and two of R&D organizations. In this account and from the data in Table 6.2, it seems that farmers in the Native Potatoes Platform were mainly concerned with how the projects were implemented and with the extent to which they corresponded to and satisfied their needs. Probably it was also the case of farmers in the Peach Local

Platform focus group session, but the presence of a higher number of representatives from local governments and R&D organizations resulted in a balanced prioritization of functions.

6.4 How did the CD-PIC and the Local Platforms operate in practice?

This section discusses CD-PIC and Local Platforms members' different views about the operation of the platforms in relation to:

- CD-PIC and Local Platforms fulfilment of functions
- CD-PIC decision making process
- CD-PIC mechanism of participation
- The role of facilitation within the CD-PIC and Local Platforms

As discussed in Chapter 3, these operational dimensions were identified with the participants as the dimensions through which the operation of the CD-PIC and Local Platforms could be researched in-depth.

There are differences and similarities between the operational dimensions listed above and those studied in the ANDIBOL case. During the explanatory step (step 1) of the understanding the case stage (stage 2) of the research process discussed in Chapter 3, the participants in both cases identified decision making processes, participation and the role of facilitation as dimensions to be researched in-depth (deepening step) to understand the operation of the platforms. Differently, the structure of relationships of coordination and information exchange, and the internal management of the platform were identified only in the ANDIBOL case, and the fulfilment of functions only in the CD-PIC and Local Platforms case.

However, although issues relating to the structure of relationships and information exchange were not identified by the participants for the in-depth exploration of the operation of the CD-PIC and Local Platforms, data in relation to these issues was gathered along with data on the decision making process, mechanism of participation and the role of facilitation. Therefore, differently from the ANDIBOL case, the discussion about the patterns of relationships and information exchange between members of the CD-PIC and Local Platforms is not presented in a separate sub-section, but as part of the discussion in Sub-sections 6.4.2, 6.4.3 and 6.4.4. Regarding the second difference in the dimensions studied in both cases (the internal management of ANDIBOL, and the fulfilment of functions in the CD-PIC and Local Platforms case) both dimensions included the analysis of procedures. While failures in the internal management of ANDIBOL were related to the lack of procedures for decision making and information exchange, these procedures in the CD-PIC and Local Platforms case are explored in Sub-section 6.4.1 as the procedures used by the participants in fulfilling their functions.

6.4.1 CD-PIC and Local Platforms fulfilment of functions

As outlined in Chapter 4, the CD-PIC's internal regulation (CDC, 2009) specifies the set of competences that the CD-PIC should perform in order to accomplish its functions both as body of technical and administrative direction of the Continuous Innovation Programme as well as body of strategic orientation of agricultural innovation processes in Cochabamba. These competences are:

1. Analyze, prioritize and suggest adjustments to Local Platforms' research and technology transfer mandates in correspondence with departmental development priorities.

2. Evaluate and approve terms of reference to recruit specialized organizations for the provision of research and technology transfer services in response to Local Platforms' mandates.

3. Evaluate, approve and allocate projects to the best bidders.

4. Monitor and evaluate the implementation of projects and their results.

CD-PIC members were asked to express their point of view regarding how the CD-PIC performed these competences. Data regarding the first competence was gathered separately from the other three, because its formulation includes some elements associated with the functions of the CD-PIC as a body of strategic orientation of innovation processes. Instead, the other three competences correspond to the functions of the CD-PIC as a body of technical and administrative direction of the programme, particularly linked to the bidding process for allocating research and technology transfer projects. The data was gathered applying an electronic questionnaire and then was validated and deepened through interviews.

Regarding the competences of analyzing, adjusting and prioritizing research and technology transfer mandates, the 8 CD-PIC's members were asked to qualify the resulting mandates in terms of: i) the extent to which they corresponded to or were the result of the articulation of members' different visions and ideas about agricultural innovation priorities, and ii) the extent to which the mandates articulated local needs with departmental development priorities and policies. Table 6.3 presents the information gathered through the electronic questionnaire using an evaluative scale ranging from "very high" to "very low".

Table 6.3 CD-PIC members' perceptions about the performance of the competences of analyzing, adjusting and prioritizing research and technology transfer mandates

Representative of:	Extent to which the mandates corresponded to members' different visions					Extent to which the mandates articulated local needs with departmental development priorities and policies				
	Very high	High	Medium	Low	Very low	Very high	High	Medium	Low	Very low
R&D org. 1										
R&D org. 2										
P. University										
Pr. University 1										
Pr. University 2										
DG										
CPE										
SMPFF										

These responses were used as a basis for discussion during individual interviews with CD-PIC members. Interviewees provided a more nuanced picture about the data, making reference to the following aspects.

One clarification referred to how decisions were taken in the CD-PIC. All the interviewees stated that all decisions were taken by consensus among all the members. Consensus was achieved because everyone had access to the same information, had the same opportunities to express their opinion, and all views were equally considered. As expressed during the interviews:

"The consensus is the basis for decisions. Achieving consensus takes time, often more than one committee meeting. Very often the committee members request additional information to be convinced that they are taking the correct decisions. This makes decision making processes slow, but there is a gain in quality and participation" (Technical Secretariat's member).

"To decide which mandates are priorities to be addressed by the programme, all members must agree. We all express our opinion and ideas; of course there are members who know

more about the issues of agricultural research and technology, but everyone's opinion is of equal value" (Chamber of Private Entrepreneurs' representative).

However, when interviewees were asked if deciding by consensus meant the articulation of members' different views regarding agricultural innovation needs and priorities, it was recognized that they actually referred to consensus regarding whether local mandates corresponded to the objectives and expected results of the Programme. In this sense, the interviewees stressed that, as a committee, they had not shared or discussed sufficiently other needs and priorities for agricultural innovation than those specified by the programme. The following statements illustrate this aspect:

"During the last two years, the decisions taken by the committee have been bounded by the agenda defined by the programme. This means that what we did was to see whether local mandates corresponded with what was already defined by the programme and decide the best way to satisfy these mandates" (Representative of Private University 2).

"Until now, we have been functioning according to the agenda defined by the programme due to our responsibility to implement the programme in Cochabamba. Making decisions about the implementation of the programme has concentrated most of our efforts. We have not had time, or maybe we have not been active enough, in generating a shared vision about agricultural innovation priorities and how these articulate with the development priorities of the department" (Representative of Private R&D organization 1).

"I think that because we focused our work on the implementation of the programme and on the achievement of its objectives and results, we have not discussed research and technological needs of other crops, apart from native potatoes and peach, also important to the development of the competitiveness and productivity of the department. This is why I consider that our decisions were not the result of articulating different views regarding agricultural innovation priorities for the department" (Departmental Government's representative).

The three statements above are coherent with the data in Table 6.2 regarding the articulation of local research and technology transfer mandates with departmental development priorities and policies. Additionally, the interviewees stressed that the committee had made little progress with regard their functions as a body of strategic orientation of innovation processes in Cochabamba. For example:

"Working on a previously defined agenda [the implementation of the Programme] with little attention to other strategic issues has resulted in no progress in promoting the formation of new Local Platforms for other important crops, or in our contribution to the definition of departmental agricultural innovation priorities" (Public University's representative).

"We have not been active in promoting interactions and relationships with other organizations, especially public organizations and authorities, to generate agricultural innovation programmes or reflect on the problems affecting the agriculture sector in Cochabamba" (Small and Medium Private Firms Federation's representative).

The evidence so far suggests that although participants conceptualized the functions of the CD-PIC in a manner that corresponded to what was proposed by the Continuous Innovation Model (as discussed in Section 5.3), in practice the functions specified in the Continuous Innovation Programme design received more attention and their performance achieved greater progress. This aspect was even more evident when CD-PIC's members were asked to qualify how the CD-PIC performed the competences associated with the conduct of the competitive process for allocating projects in response to Local Platforms' research and technology transfer mandates. Table 6.4 presents the information in this regard, gathered through the electronic questionnaire.

Table 6.4 CD-PIC members' perceptions about the performance of its competences associated with the bidding process for allocating projects

How satisfied are you with the performance of the CD-PIC's competences in relation to the bidding process for allocating projects?		Evaluative scale					Evaluative scale					Evaluative scale				
		Very high	High	Medium	Low	Very low	Very high	High	Medium	Low	Very low	Very high	High	Medium	Low	Very low
		Evaluate and approve terms of reference to recruit specialized organizations for the provision of research and technology transfer services in response to Local Platforms' mandates.					Evaluate, approve and allocate projects to the best bidders.					Monitor and evaluate the implementation of projects and their results.				
Representative of:	R&D org. 1															
	R&D org. 2															
	P. University															
	Pr. Univ.1															
	Pr. Univ. 2															
	DG															
	CPE															
	SMPFF															

When this analysis was presented to the CD-PIC members for discussion during individual interviews, the first reaction was that the data contained in Table 6.4 reflected properly what the committee members felt was the main field of activity.

"This is precisely what we did during the last two years; leading and making decisions regarding the competitive process of allocation of projects. I think that we have accomplished our functions of direction fairly well" (R&D organization 2's representative).

"Our decisions regarding the quality of the terms of reference, the allocation of projects and in relation to projects' monitoring and evaluation have always been taken considering everyone's point of view. This has ensured that the resources were used to satisfy Local Platforms' mandates: competitively, with quality and transparency" (Private University 2's representative).

"I consider we have directed the process of allocation of projects with the efficiency and results showed in the table because we have had the pressure, responsibility and the compromise with COSUDE to implement the programme according to its objectives and expected results. Additionally, I think we have accomplished this responsibility well enough because this type of work is common for us; many of us we are also members of steering committees of other projects or organizations" (Private University 1's representative).

Elaborating on the same topic, the interviewees emphasized that the quality of the decisions taken by the committee depended on the work developed by the Technical Secretariat. They mentioned that the secretariat not only provided relevant information, but also developed the procedures through which the competitive process of allocation of projects was conducted, including the development of terms of reference, procedures and criteria to evaluate proposals and to monitoring and evaluating project implementation and results. However, they also asserted that dependence on the work of the secretariat suggested a certain level of risk of making wrong decisions if the information and procedures developed by the Technical Secretariat were not proper and accurate enough:

"The role of the Technical Secretariat was key to the implementation of the programme, not only operating the decisions of the committee, but also providing information and developing instruments that allow us to perform our functions" (Representative of the Chamber of Private Entrepreneurs).

"All our decisions were taken using the information provided and the instruments developed by the secretariat. Fortunately the secretariat is a very capable team; whether our decisions were correct or incorrect depended on the quality of the information and procedures provided by the Technical Secretariat" (Public University's representative).

This consideration was in keeping with the data collected though the electronic questionnaire regarding the characteristics of the information and procedures used by the

CD-PIC to take decisions on the bidding process for allocating projects. Table 6.5 presents the data gathered through the electronic questionnaire in this regard.

Table 6.5 CD-PIC members' perceptions about the information and procedures used to make decisions

How satisfied are you with the information used by the CD-PIC to make decision in relation to the bidding process for allocating projects?		The information used by the CD-PIC to make decisions is:			The information used by the CD-PIC to make decision is:			The information used by the CD-PIC flows through:		
		Sufficient	Moderately sufficient	Insufficient	Relevant	Moderately relevant	Not relevant	Suitable channels	Moderately suitable channels	Not suitable channels
Representative of:	R&D org. 1									
	R&D org. 2									
	P. University									
	Pr. University 1									
	Pr. University 2									
	DG									
	CPE									
	SMPFF									

How satisfied are you with the procedures used by the CD-PIC to make decision in relation to the bidding process for allocating projects?		The procedures used by the CD-PIC to take decisions are:			The procedures used by the CD-PIC to take decisions are:		
		Clearly defined	Moderately clear	Unclear	Easy to apply	Moderately easy to	Difficult to apply
Representative of:	R&D org. 1						
	R&D org. 2						
	P. University						
	Pr. University 1						
	Pr. University 2						
	DG						
	CPE						
	SMPFF						

The discussion so far suggests differences with the ANDIBOL case. Although there were differences in opinion regarding whether it was right or wrong that the CD-PIC has been focused on the implementation of the programme, the performance of this function, the procedures for decision making and information exchange, were assessed positively by all, even if the information content and working procedures were built almost exclusively on

the basis of what was defined in the programme design and even if no procedures nor information exchange were developed regarding the functions of strategic orientation of agricultural innovation in Cochabamba.

Another difference refers to the role of the Technical Secretariat of the CD-PIC and the R&D organization facilitating ANDIBOL. While in the ANDIBOL case the dependence on the R&D organization for the exchange of information and development of procedures was considered as one of the factors responsible for failures in the internal management of the platform, the work of the Technical Secretariat in this regard was positively considered by the CD-PIC members, even if the dependence on the work of the secretariat could threaten the quality of the decisions. It seems that underlying this difference is the fact that the R&D organization in performing simultaneously the role of ANDIBOL facilitator, InnovAndes implementing partner and research and technology transfer provider, confronted problems in balancing its multiple roles, and entered in contradiction with other ANDIBOL members' (especially firms') interests and expectations. Conversely, the Technical Secretariat, in accordance with the CD-PIC internal regulations (see Table 4.6 in Chapter 4) and in line with the Continuous Innovation Programme design, was assigned with the sole responsibility of facilitating the implementation of the programme at local and departmental levels. The role of the Technical Secretariat is explored in detail in Sub-section 6.4.4.

Turning to the local level, during the focus group sessions held with members of the two Local Platforms, participants[9] were asked to identify and prioritize the problems they confronted and the progress they achieved in performing their functions. Problems and progress were identified through brainstorming and then prioritized, as previously, by

[9] Participants in the focus group sessions reported in this Sub-section were the same that attended the focus group sessions reported in Section 6.3.

asking each participant to vote for those that they considered the most important. Table 6.6 summarizes the data collected.

Table 6.6 Local Platforms members' perceptions about problems and progress in performing their functions

Native Potatoes Local Platform					
Number of participants in the focus group session: 6 Possible number of votes per participant: 5[1] Total number of votes: 30					
Problems	**Voting results**				
	1st	**2nd**	**3rd**	**4th**	**5th**
Poor participation of farmers		7			
The platform is concerned only with potatoes		7			
Few institutions (R&D organizations and service providers) participating in the platform			5		
Difficulties in organizing meetings	8				
Municipal authorities are changed frequently				3	
Progress	**Voting results**				
	1st	**2nd**	**3rd**	**4th**	**5th**
We have our internal regulations				4	
We have more information and we know what the projects are doing		7			
We have more control over the institutions	9				
Our demands have been considered by the projects			5		
The design and implementation of projects have improved			5		

Peach Local Platform					
Number of participants in the focus group session: 8 Possible number of votes per participant: 5[1] Total number of votes: 40					
Problems	**Voting results**				
	1st	**2nd**	**3rd**	**4th**	**5th**
Poor engagement and commitment of Municipal Governments			7		
We only consider problems in the production and commercialization of peach.	12				
Not everyone accomplish their commitments		9			
Platforms meetings are difficult to call and carryout	12				
Progress	**Voting results**				
	1st	**2nd**	**3rd**	**4th**	**5th**
Active participation of producers' associations and institutions (R&D organizations and service providers)			8		
We have a more developed vision about what we need to do in the medium term to improve the production of peach		9			
We have better relationships and interactions between producers and institutions			8		
Projects are planned, implemented and evaluated considering everyone's point of view	11				
More institutions and producers want to be part of the platform				4	

[1] Participants could vote for one alternative more than once

After voting, participants were asked to elaborate on the results. Comments suggested that problems of organizational type (participation, engagement and commitment, and type and number of members participating) were those affecting the operation of the platforms. As stated by participants:

"Apart from producing potatoes we also have problems and needs in other crops. Because the platform and the project [the Programme] is only about potatoes, we feel that the project does not consider all our needs and this is why we are not motivated to participate more actively (Representative of producers' association, Native Potatoes Local Platform).

"Additionally in this respect, other institutions [R&D organizations, NGOs and service providers] that are not working on potatoes, they are not interested on to be part of the platform. On the other hand, because the municipal government's representative is changed continuously, each new representative has his/her own vision about priorities; if his/her priorities relate to improve the production of potato he/she participates actively" (R&D organization's representative, Native Potatoes Local Platform).

"The production of peach is a big priority for the municipal government. However we have many other things, demands and problems solve. This is why we do not have enough time to participate as we wish" (Local government's representative, Peach Local Platform).

"We depend on the work of the engineers (the Technical Secretariat) to organize our meetings. We are all involved in many other activities; so it is difficult to arrange dates on which everyone can attend. It is also difficult to motivate attendance; in this sense the engineers support us in calling and preparing meetings, and even providing transportation and refreshments for participants" (Representative of producers' association, Peach Local Platform).

Table 6.6 shows some interesting similarities and differences between both Local Platforms regarding the identification and prioritization of problems. The fact that the platforms are concerned only with the production of potatoes or peaches seems to indicate that in both cases the participants in the focus group sessions perceived that the potential offered by the platforms to address the wide range of needs and problems affecting them was not sufficiently exploited. Furthermore, they perceived that the focus on potatoes and peach limited more active participation and involvement of current and new members. However, members of the Native Potatoes Local Platform explained that by referring to the lack of participation of farmers and other service providers they were mainly concerned to the implementation of projects involving crops different than potatoes. For their part, members of the Peach Local Platforms indicated that by claiming for a more active involvement of local governments they were interested on getting support from local authorities or to articulate with local policies. As discussed in Section 6.3, these differences might result from differences in the composition of each local platform, which in turn was reflected in the list of participants in each focus group session.

In relation to the progress achieved, participants made the following observations in relation to the results of the voting exercise:

"Now we participate in monitoring the extent to which the projects satisfy our requirements. In the past the institutions (R&D organizations) worked in isolation and without coordination between them. Now we coordinate better with institutions to express our needs and to implement projects" (Representative of producers' association, Peach Local Platform).

"The representatives of the producer associations and the institutions (R&D organizations) present periodic reports on the progress of projects. So we have more

information about what they are doing and we can control whether the projects are beneficial" (Representative of producers' association, Native Potatoes Local Platform).

Common to both Local Platforms is the identification of progress in monitoring and evaluating the implementation of projects as well as in identifying and prioritizing problems and needs. However members of the Peach Local Platform emphasized improvements in how local actors relate, coordinate and interact with R&D organizations, and also the development of a shared vision about what they need to do in the medium term to improve the production of peach. Comparing both Local Platforms, the evidence suggests that while the members of the Peach Local Platform were equally concerned with problems and progress on the fulfillment of the functions suggested by the Continuous Innovation Model and the Continuous Innovation Programme, the performance of function in line with the implementation of the programme received more attention from the members of the Native Potatoes Platform.

6.4.2 CD-PIC's decision making process

This sub-section focuses on the decision making process associated with the competitive allocation of projects in response to research and technology transfer mandates. The CD-PIC's internal regulation (CDC, 2009) establishes three general steps for the decision making process. These steps are:

1. Providing and receiving information
2. Analyzing information and suggesting decisions
3. Taking final decisions

The same internal regulation also outlines that the Local Platforms, the CD-PIC and the Technical Secretariat are the three Continuous Innovation Programme structures that should be involved in each of the steps of the decision making process. This aspect was

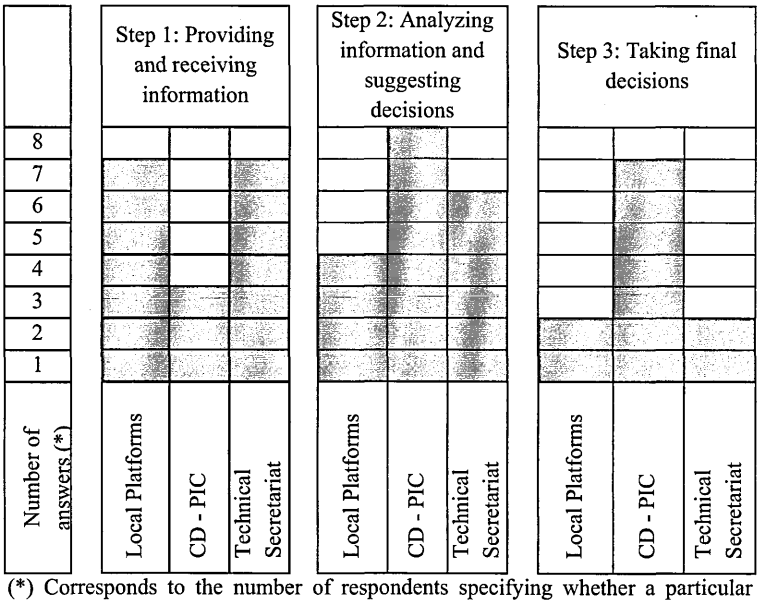
outlined in Chapter 4 and depicted in Figure 4.1. Table 6.7 below synthesizes what the CD-PIC's internal regulation establishes regarding the participation of each Continuous Innovation Programme structures in each step of the decision making process.

Using the electronic questionnaire referred to in the previous sections, the CD-PIC's members were asked to identify how Local Platforms, the CD-PIC and the Technical Secretariat were involved in each of the steps of the decision making process. Table 6.8 presents the information gathered through the electronic questionnaire.

Table 6.7 Participation of each Continuous Innovation Programme structures in decision making

	Providing and receiving information	**Analyzing information and suggesting decisions**	**Taking final decisions**
Local Platforms	Generating research and technology transfer mandates		
	Suggesting adjustments to final design and work plan of the winning project proposals		
	Providing information on the progress of projects for monitoring purposes, and suggesting adjustments		
	Providing information on the results of projects for evaluation purposes		
CD-PIC		Prioritizing research and technology transfer local mandates	
		Approving terms of reference	
		Analyzing projects proposals	Designating and hiring winning project proposals
		Approving projects monitoring and evaluation reports	
Technical Secretariat	Capturing, interpreting, synthesizing, giving structure, and communicating the information generated and used by the Local Platforms and the CD-PIC		
	Preparing terms of reference		
	Analyzing project proposals and make suggestions for approval, adjustment or rejection		
	Analyzing project monitoring and evaluation reports and make suggestions for approval, adjustment or rejection		

Table 6.8 Participation in the decision making process



(*) Corresponds to the number of respondents specifying whether a particular structure was involved in a particular step. For example, 7 respondents indicated that Local Platforms were involved in providing and receiving information. The total number of respondents is 8.

When Table 6.8 was presented for validation to the CD-PIC´s members during an ordinary committee meeting, participants considered that the data showing the participation of each structure in each of the steps of the decision making process was coherent with the Continuous Innovation Programme and with the role of each structure within the programme. For example, in the first step (providing and receiving information), most of the participants agreed that it was consistent with the programme that the Local Platforms had a preponderant participation in providing information on their needs and priorities as a fundamental input for decision making. In the same vein, they also qualified as coherent the participation of the Technical Secretariat, arguing that this was precisely its role: synthesizing and channeling (providing and receiving) information between the Local Platforms and the CD-PIC. However, regarding the participation of the CD-PIC in providing and receiving information, participants also found that the level of participation shown in Table 6.8 corresponded to what was expected from the CD-PIC arguing that most

of the information that they could provide was already included in the Continuous Innovation Programme, and that most of the information they needed to take decisions was generated by the Local Platforms and captured by the Technical Secretariat.

Regarding Step 2 - analyzing information and suggesting decisions - participants acknowledged that the participation of the CD-PIC in this step corresponded to its functions of administrative and technical direction of the programme in Cochabamba. In the same vein, participants recognized that the Technical Secretariat has a key position in suggesting decisions because it concentrates almost all the information needed to make final decisions. This aspect has been frequently mentioned by CD-PIC members in mostly positive terms, arguing that this was precisely the type of work that they expected from the secretariat: to facilitate the work of the CD-PIC providing information previously synthesized and suggesting alternatives on which the committee can work. On the other hand, as it mentioned before in this section, some other members perceived a risk of dependence on the work of the secretariat.

In relation to the participation of Local Platforms in analyzing information and suggesting decisions, differences emerged among the participants when they were asked for their opinion regarding the results in Table 6.8. On the one hand, there were those explaining that, in accordance with the Continuous Innovation Programme, Local Platforms were involved in analyzing information and suggesting decisions in two ways: first, by suggesting decisions through the generation of research and technology transfer mandates, which in turn were part of the information used by the CD-PIC to make decisions; and second, by suggesting changes in the implementation of projects according to the results of monitoring and evaluation carried out at local level. On the other hand, there were those who thought that that the participation of local actors in providing information through the Technical Secretariat and in evaluating projects did not mean that they were involved in

analyzing and suggesting decisions. They asserted that this was exclusively done by the CD-PIC with the support of the Technical Secretariat.

Divergences were also important in analyzing the third step of the decision making process (making final decisions). Some members considered that it was consistent with the implementation of the Continuous Innovation Programme that the Local Platforms did not show a preponderant participation in making final decisions, because this was precisely the function of the CD-PIC as body of direction of the programme. They also justified their position affirming that the final decisions involved the perspective of Local Platforms because they were made on the basis of the information provided by them through the Technical Secretariat.

On the other hand, some members considered that this was precisely one of the major weaknesses of how the Continuous Innovation Programme has been put in practice. They considered that a representation of Local Platforms must be part of the committee and as such Local Platforms should participate in final decisions. They argued that, otherwise, there was no difference with other ways of carrying out research and technology transfer projects, in which farmers are just instrumentally consulted about their needs, expectations and about their satisfaction with the services provided, but not involved in making decisions on how their needs should be served. These members also argued that, although the role of the Technical Secretariat in intermediating information between the local and the departmental level was necessary and important, it was not a substitute for the direct involvement of local actors in the final decisions affecting them.

The discussion so far suggests some similarities with the ANDIBOL case. The Technical Secretariat similar to the R&D organization facilitating ANDIBOL appears in the centre of the relationships and information exchange between members of the CD-PIC, and between the CD-PIC and Local Platforms. In fact, as will be discussed in Sub-section 6.4.4, no

direct relationships were developed between the departmental and local levels, and the Technical Secretariat acted as the bridge connecting both levels. The evidence suggests that this arose from converting the CD-PIC, Local Platforms and the Technical Secretariat into operative structures for the implementation of the programme, as depicted in Figure 4.1 in Chapter 4.

6.4.3 CD-PIC´s mechanisms of participation

While the previous sub-section discussed the involvement of the CD-PIC, the Local Platforms and the Technical Secretariat in decision making, this sub-section moves on to discuss data about the mechanisms of participation. According to the data gathered through meeting observations and organizational documentation review, meeting attendance was the main mechanism of participation in decision making. In other words, it was mainly during regular meetings (normally monthly meetings) that members met and interacted, received and analyzed information, and took decisions. According to the CD-PIC meetings´ minutes reviewed, the standard agenda of a regular meeting includes the following points:

- Reviewing and approving previous meeting´s minutes
- Reviewing received and sent correspondence of mailing sent and received
- Discussing administrative issues associated with the implementation of the Continuous Innovation Programme.
- Discussing technical issues associates with the competitive process of projects allocation.

The meeting minutes showed that the meetings focused largely on analysing information and making decisions on administrative issues frequently associated with the management of the resources of the Continuous Innovation Programme, and administrative matters

related to the hiring and operation of projects within the bidding process for allocating projects. This included among other things the revision and approval of financial reports, project budgets, authorization of disbursements, and signing contracts. In second place, the revision of the minutes showed that during the meeting the CD-PIC members focused on discussing technical issues related to the approval of terms of reference, project proposals, and project monitoring and evaluation reports.

Two aspects stand out from the minutes of meetings, which were then verified through meeting observation: first; all the administrative and technical information discussed in the CD-PIC's meetings was prepared and presented by the Technical Secretariat; and second, meetings did not address issues associated with the functions of the CD-PIC as body of strategic orientation of agricultural innovation at departmental level.

When this evidence was presented for validation during a regular meeting of the CD-PIC (the same meeting referred to in the previous sub-section), the participants argued that actually the meetings did not serve to discuss what they call "strategic aspects" of the CD-PIC and the Continuous Innovation Programme. The representative of one of the R&D organizations participating in the meeting concretely referred to aspects associated with the discussion of agricultural innovation priorities and how they articulate with development priorities of the department. In the same vein, the representative of the Public University together with the representative of the Chamber of Private Entrepreneurs explained that, because of the preponderance of administrative themes and the focus on aspects related to the implementation of projects, those members with no involvement in current projects and even in future projects, showed a passive and erratic participation. Both asserted that this was especially true among public members and members with no links with the agricultural sector or with research and technology transfer. In this respect, the representative of the Departmental Government argued that some members were motivated to participate in the committee because of the possibility of discussing themes that go

beyond the implementation of projects, that is, to discuss departmental innovation priorities and policies. In this sense, he asserted that it was clear that some of these members did not find their interests satisfied.

When the participants were asked to analyse the patterns of interaction and relationships between members, they considered that having monthly meetings as the only mechanism of interaction and coordination, and having the Technical Secretariat as the only channel for information exchange, was sufficient to deal with the implementation of the programme. However, they stressed that this pattern of interaction and relationships was insufficient to address more strategic issues related to agricultural innovation at departmental level. In the same vein, participants in the meeting observed that the committee has not been active in creating links with other organizations outside the committee, especially with those organizations from the public sector dealing with the development of departmental policies of development, productivity and competitiveness. In this sense, the representative of the one of the Private Universities participating in the meeting expressed the need to review the composition of the committee and to develop a communication strategy to promote the involvement and participation of other organizations.

Although the discussion above could be interpreted as suggesting some similarities with the ANDIBOL case, the evidence showed that the absence of direct relationships and information exchange between CD-PIC members was not assessed negatively when the participants talked about their main field of activity: the technical and administrative direction of the programme.

6.4.4 The role of the Technical Secretariat as facilitator

The previous sub-sections have been focused on discussing how the CD-PIC and Local Platforms members evaluated the performance of their functions after almost two years of

working and on how members assessed their participation in the decision making process associated with the implementation of the Continuous Innovation Programme. The discussion in the previous sub-sections also provided some preliminary evidence about the work and role of the Technical Secretariat that will be discussed in-depth in this sub-section. Data in this regard was gathered interviewing key informants from the CD-PIC, Local Platforms and members of the Technical Secretariat.

According to the data provided by the interviewees, the role of the Technical Secretariat can be analyzed at two levels: i) working between the CD-PIC and the Local Platforms as an information channel; and ii) working for, or as part of, the CD-PIC and of the Local Platforms.

The Technical Secretariat working between the CD-PIC and Local Platforms as an information channel

The interviewees described the Technical Secretariat as a "hinge" between them and the Local Platforms. Acting as a hinge, the secretariat captured, synthesized, sorted, gave structure, and communicated information generated by both sides connected by the hinge. Interviewees recognized that the information provided by the Technical Secretariat was the main input for decision making, including information regarding administrative and technical aspects of the competitive process of allocation of research and technology transfer projects and also information about the implementation of projects, such as progress reports and monitoring and evaluation reports.

The respondents also considered that the work of the Technical Secretariat has been important in connecting the CD-PIC and Local Platforms with the organizations proposing and implementing research and technology transfer projects within the competitive process of allocating projects. The information provided by the Technical Secretariat included terms of reference, summaries of projects proposals, information related to the allocation

and hiring of providers, progress reports, monitoring and evaluation reports. To perform this role, the secretariat has developed a variety of formats to compile and share information, according to the expectations and requirements of the Local Platforms, the CD-PIC and COSUDE.

According to the data, the role of "hinge" or "information channel" was considered by the respondents as key for the operation of the programme. Interviewees highlighted the following:

"The information provided by the secretariat is probably the only way we have to approach and know about Local Platforms, and vice versa. We trust in the information that the secretariat provides when we make decisions. We strongly consider the suggestions of the technical team, because it translates and represents technically the opinion and the needs of the local actors" (Key informant from the CD-PIC).

"The engineers [the Technical Secretariat] tell us what is happening in the project [the programme]. For example they give us information on whether our mandates are approved or not by the funder [the CD-PIC], and also information about the institutions that works implementing the projects [the research and technology transfer providers]" (Key informant from the Native Potatoes Platforms).

"We spend much time in preparing and communicating the information that the committee and the Local Platforms use to make decisions. I think this is crucial for the implementation of the programme at both level. This is the way by which both level interact and know each other" (Member of the Technical Secretariat).

The evidence suggests that according to the Continuous Innovation Programme design, the Technical Secretariat supported the articulation between the CD-PIC and the Local Platforms, basically by managing information and by developing procedures for the implementation of the programme. Differently from the ANDIBOL case, where the role of

facilitation of the platform was assigned to the R&D organization that acted simultaneously as InnovAndes project implementing partner and research and technology transfer provider, the Technical Secretariat had as its only responsibility to facilitate the implementation of the programme.

The secretariat working for or as part of the parties

Working for or as part of the of the CD-PIC, what stands out first is the proactive role that the Secretariat has had in guiding the development of the internal regulation of the CD-PIC and the development of the procedures for the competitive process of projects allocation. Both constituted the main body of rules and procedures on which the work of the committee and the interaction between their members were based.

As explained before, an important part of the work agenda of the Secretariat consisted in the management of information used by the committee to make decisions. Part of this work involved the preparation and call for regular monthly meetings of the committee. Considering that meetings were the main mechanism of participation and decision making used by the committee, the role of the Secretariat in this regard acquired significant relevance. The Secretariat promoted meeting attendance, prepared meetings memoires, proposed themes for discussion, and provided information and suggestions with which the committee made decisions. Because of the last point, the Secretariat was frequently referred to by the members of the CD-PIC as the technical advisor of the committee. Also at this level, the Secretariat was viewed as the "operative arm" of the committee in the sense that it put in place all the decisions made by the committee. This included a variety of actions ranging from communicating committee decisions, preparing administrative and technical reports, to the organization and implementation of assigned activities.

When the Technical Secretariat worked closely or as part of the Local Platforms, it was perceived in a different manner. It was considered as the technical staff of a project that

supports the platform both technically and organizationally. Among members of the Local Platforms, especially among farmers, the most common perception was that the programme was a project implemented and funded by the CD-PIC. In this context, the Technical Secretariat was a team of experts pertaining to the CD-PIC, working in the field to support them (the Local Platforms) as beneficiaries of the project.

Part of the services provided by the project, therefore part of the work of the technical team, was to support local actors in forming and operating a local platform. This interpretation may suggest that local actors considered the programme's efforts in promoting the formation of Local Platforms as a variation of the type of actions that development organizations normally carry out to encourage the creation of producers associations or to strengthen existing ones, whether as part of the objectives of the projects or as a condition for farmers to have access to the services of the projects.

In this field, local actors recognized the contribution of the Secretariat in the internal management of the Local Platforms. Regarding organizational aspects, the support provided by the Secretariat included direct participation in the development of the internal regulations, the organization of regular meetings promoting the participation of a diversity of actors, and offering suggestions and even guiding discussions during platform meetings. Local platform actors also endorsed the participation and contribution of the Secretariat in the development of relationships with entities in the environment, such as municipal governments, R&D organizations and other development organizations.

According to the evidence discussed above, the role that the Technical Secretariat had between and within the CD-PIC and Local Platforms was key in the overall operation of the programme in Cochabamba; a role beyond that which was expected from a facilitating agent in the Continuous Innovation Programme design. The discussion also makes another fundamental difference with the ANDIBOL case. Because the Technical Secretariat came

to life as an operational structure for the implementation of the Programme and because its functions were defined in correspondence with the role of the CD-PIC and Local Platforms, neither tensions nor conflict arose between the three.

6.5 Conclusions

As mentioned in the introduction of this chapter, this section presents conclusions regarding whether the CD-PIC and Local Platforms evolved as proposed by the Continuous Innovation Model and the Continuous Innovation Programme, in correspondence with or in contradiction to platforms members' understanding and expectations, as well as conclusions about the factors influencing such evolution.

Regarding the CD-PIC, the evidence discussed in this chapter shows that the platform came to life as a body of technical and administrative direction of the programme, and as a body of strategic orientation of agricultural innovation processes at departmental level, and its functions were defined in correspondence with both the model and the programme guidelines. However, the evidence shows that after two years of working, and despite the fact that CD-PIC members conceptualized the rationale of the platform's existence in line with the critical elements of the model, the platform evolved as defined in the Continuous Innovation Programme design. Thus, it was found that the Continuous Innovation Programme, by establishing the competitive bidding process for allocating research and technology transfer projects as the process that the CD-PIC should follow in performing its functions, and by turning the platform into an operative structure for the implementation of the programme, strongly influenced how the platform actually operated.

In this regard, as discussed in Section 6.3, although there were differences in opinion regarding whether it was right or wrong that the CD-PIC has been focused on the implementation of the programme, no tensions or conflicts arose between members as it happened in the ANDIBOL case. While in the ANDIBOL case different members adopted

different positions and held different and even opposite interests, within the CD-PIC each member adopted the position of director, all with competences to evaluate, approve and take decisions about the overall implementation of the bidding process for allocating projects. In this context, the CD-PIC members assessed positively the patterns of relationships and information exchange between members, the decision making process, the working procedures, and the mechanisms of participation. However they found them insufficient to address more strategic issues related to agricultural innovation at departmental level.

In relation to the Native Potatoes and Peach Local Platforms, the evidence shows that members of both Local Platforms identified functions that corresponded to both the model and the programme design. However, the evidence also suggests that differences in composition influenced the level of priority assigned to each type of function. While in the Native Potatoes Platform, formed mainly by farmers and R&D organizations, issues related to the implementation of the programme were prioritized. In the Peach Local Platform, with a more balanced number of farmers, R&D organizations and local government members in its composition, functions associated with the model and to the programme were equally prioritized.

The last concluding point refers to the role of facilitation. It was found that, as in the ANDIBOL case where the role of facilitation was strongly influenced by the InnovAndes project design, the Continuous Innovation Programme guided how this role was performed by the Technical Secretariat. However the influence was totally different. While in the ANDIBOL case, multiple roles, including the role of facilitation, were assigned to the one of the members of the platform (the R&D organization), the Technical Secretariat was only assigned the responsibility of facilitating the implementation of the Continuous Innovation Programme at departmental and local levels. In this regard, while, in the ANDIBOL case, the R&D organization confronted problems in balancing its multiple roles and own

interests both as facilitator and as an ANDIBOL member, and entered into contradiction with other ANDIBOL members' (especially firms') interests and expectations, the Technical Secretariat did not face this kind of ambiguity or conflict of interests, and its function was defined in correspondence with the functions of the CD-PIC and Local Platforms. However, the evidence suggests that the Technical Secretariat, rather than acting as a facilitator, acted as an operative structure in the implementation of the programme.

A theoretical discussion of the findings above, along with the findings on the ANDIBOL case, is offered in the next chapter.

Chapter 7 Driving institutional innovation for agricultural innovation through R&D projects: the InnovAndes Project and the Continuous Innovation Programme

7.1 Introduction

Chapters 5 and 6 focused on discussing how, over time, the different participants involved in the institutional innovation process of formation and operation of the multi-stakeholder platforms had built their own understanding and expectations about the platforms. The chapters also analysed how different understanding and expectations corresponded to, were affected by, or shaped in practice the critical components of the conceptual models and definitions contained in the R&D projects design. Finally, the chapters considered how the operation of the platforms was differently perceived by the participants in line or in contradiction to their understanding and expectations.

A common finding in Chapters 5 and 6 is that none of the platforms evolved as proposed by their respective conceptual model. The first point of departure from the models was introduced in the design of the R&D projects: in both, the InnovAndes Project and the Continuous Innovation Programme, the platforms, and the process of formation and operation of them, were conceived as instruments to achieve the projects' core objectives and outcomes, and consequently platforms' functions and participating actors' roles and positions were defined to respond to them.

The second point of departure relates to the extent to which the projects were implemented according to their design and therefore to the extent to which the platforms evolved as defined in the projects. Findings in Chapters 5 and 6 are different in this regard. Findings in Chapter 5 show that neither the InnovAndes Project was implemented, nor ANDIBOL evolved, as expected in the project design. This was because of differences and tensions among the participating actors regarding the extent to which the project definitions were in line with or in opposition to their understanding and expectations about the rationale of ANDIBOL's existence. Some platform members (participating R&D organizations and

farmers) agreed that ANDIBOL was an instrument to achieve the project's core objectives and outcomes and also agreed with the assignment of roles and positions to the various members within the platforms. However, other actors (specially participating firms) perceived that such definitions did not correspond to what they considered the core business of the platform and they were not willing to adopt the roles and positions assigned to them. Moreover, participating firms pointed to the tensions and contradictions introduced by the InnovAndes project as reasons for failure in developing a shared vision, common objectives, working and decision making procedures to implement an agenda of activities collectively defined and independent from the project.

Conversely, the findings in Chapter 6 show that although the platforms did not evolved as proposed in the Continuous Innovation Model, both the CD-PIC and the Local Platforms took place and operated as defined in the Continuous Innovation Programme. Different from the InnovAndes Project and the ANDIBOL case, the Continuous Innovation Programme definitions in relation to the platforms' functions, roles and positions of the participating actors were the basis on which the participants built and aligned their understanding and expectations about the operation of the platforms. The participants acknowledged that the focus on the implementation of the programme and on the achievement of its objectives and outcomes limited the development of the platforms at both levels according to the Continuous Innovation Model. However, they also agreed that how the roles and positions of the participants were defined and how the platforms operated in terms of the definition of activities, forms of participation, development and use of decision making and working procedures, corresponded to what they considered their responsibilities in the implementation of the Continuous Innovation Programme.

Taking in to account the similarities and differences among the findings from the two cases, it can be proposed as general finding that:

> When institutional innovation processes are driven through R&D projects; the extent to which these processes evolved as proposed in the conceptual models and in accordance with participants' expectations depends on: i) the extent to which the critical components of the conceptual models are incorporated and/or reshaped in the design of the projects; ii) the extent to which projects' contents correspond to the attributes (values, interests, and tradition of thinking and working) of the participants involved in the processes; and iii) how each participant constructed its own understanding of the process of institutional innovation as it related to and interacted with the other participants.

What is interesting in this general finding is that when R&D projects are used to drive processes of institutional innovation, there are factors influencing how R&D projects are designed and implemented that, in interaction with the attributes of the participating actors, determine how institutional innovation processes take place and evolve. The evidence discussed in Chapters 5 and 6 show that this happened despite differences in the critical conceptual elements of the models on which the design of the R&D projects were based on. Conceptual elements in the Papa Andina Model and in the Continuous Innovation Model in relation to what each model considered a trigger for innovation (market driven innovation or farmers' needs driven innovation), definitions about the functions, composition, participants' roles and positions, and definitions about the type of rules and procedures that member should follow in correspondence with the platforms' functions, were outlined in Chapters 5 and 6 respectively.

This chapter discusses the findings from a theoretical perspective offered by the conceptual framework in Chapter 2. Section 7.2 analyses the factors influencing how R&D projects act as drivers of institutional innovation process, focussing the discussion on: i) the

contents of the R&D project and its respective conceptual model; ii) the facilitation of the interactions and relationships between participants; and iii) the attributes of the participants.

After that, Section 7.3 discusses the effects of these factors on the results of the process of institutional innovation entailed in the formation and operation of the platforms. Finally, the conclusions in Section 7.4 focus on two of the three questions that this research seeks to answer:

- What are the factors influencing how, and with what effects, R&D projects act as drivers of institutional innovation conducive to pro-poor agricultural innovation?

- How do institutional innovation processes driven by R&D projects affect the facilitation of the interactions and relationships between the multiple actors involved?

7.2 Factors influencing how R&D projects act as drivers of institutional innovation processes

According to the conceptual framework discussed in Chapter 2, the process of formation and operation of ANDIBOL, the CD-PIC and PIC Local Platforms was to be analyzed as a R&D project driven collective action process of institutional innovation in which multiple players come together to develop and operate shared operational rules enabling them to act collectively in pursuing of shared interests. As discussed in Chapter 2, the process is represented in Box 5 of Figure 2.1 in Chapter 2 and corresponds to what the Institutional Analysis and Development framework (IAD) refers as to the action situation. Also according to the conceptual framework, the process of the formation and operation of the multi-stakeholder platforms is affected by three main factors and by the interaction between them: i) the contents of the R&D project and its respective conceptual model

(Boxes 1 and 2 of Figure 2.1 in Chapter 2); ii) the facilitation of the interactions and relationships between participants in the process (Box 3 of Figure 2.1 in Chapter 2); and iii) the attributes of the participants (Box 4 of Figure 2.1 in Chapter 2).

Each of these factors is discussed in the following sections.

7.2.1 Putting conceptual models into practice through R&D projects

Using the concepts of fidelity of implementation and local adaptation of programme intervention discussed in Chapter 2 (Century et al, 2010; Horton et al, 2013), this section analyzes the factors affecting the fidelity with which the critical components of the conceptual models were present in the design of the R&D projects when the models were put into practice. It also discusses whether differences between the models and projects, in interaction with the attributes of the participating actors led to tensions and conflicts between them.

The evidence discussed in Chapter 5 showed that the InnovAndes project design was different from the Papa Andina model in two critical components. The first relates to the purpose and functions of the platforms, and the second to guidelines regarding the role and position of the participating actors.

Regarding the purpose and functions of the platforms, the Papa Andina model proposes that multi-stakeholder platforms should be used to address market chain coordination problems and stimulate market driven joint innovation (formulate demands for research and technology transfer in response to market signals). However, the InnovAndes projects design assumes that the platform should serve to improve farmers' access to profitable markets (facilitating their linkages and interactions with other market chain actors) and to new technologies to overcome the production constraints they face in accessing and benefiting from market opportunities.

The model also implicitly suggests that all the participating actors have a role and position within the platform according to their attributes, position in the market chain, experience, resource endowment and individual interests. By contrast, the Innovandes project design only assigned roles and positions to the farmers and to the two supporting organizations that act as project implementing partners. The evidence presented in Chapter 5 shows that these differences between the model and the R&D project design were strongly influential over time on how ANDIBOL members valued the process of institutional innovation.

First, the differences constituted one of the causes that gave rise to the existence of a "hole" in the structure of relationships and information exchange inside ANDIBOL: the boundary separating members with roles and positions within the project, and the rest of the platform members. Second, by assigning roles and positions only to certain types of member, asymmetries of power were also introduced or at least had an influence on how members perceived power relations. This was reflected, for example, in i) the controversy about whether the objectives of ANDIBOL were defined by all the members and corresponded to the interests of all; ii) the diversity of opinions about the degree to which decisions were made according to an agenda of the platform, or in response to the project agenda, and therefore according to the interests of members with roles and positions in the project; and iii) the divergences of opinion about to whom ANDIBOL belonged. Despite some exceptions, the evidence shows that differences in perception on these aspects corresponded to whether an actor was part of the group of members with roles and positions in the project, or belonged to the rest of the platform's members.

This separation seems to correspond to a traditional way of assigning roles and positions in the design of R&D projects, which includes definitions regarding what activities have to be implemented, how and by whom, with what results and who should benefit from the project outcomes. According to the evidence presented in Chapter 5, the two platforms' functions proposed in the Papa Andina model were reshaped in the InnovAndes project

design as functional to the agenda of the project. In other words, this meant that decisions and activities within ANDIBOL should contribute to achieving the project's expected outcomes (farmers with access to new technologies and markets), benefiting those who had been defined as beneficiaries (farmers), and finally, specifying who should implement activities (R&D implementing partners).

The evidence in Chapter 5 shows that the design of the InnovAndes project was perceived by the participating firms (who were not assigned roles and positions) to be in opposition to their vision or understanding of what the platform's functions are, or should be. According to firms' point of view, ANDIBOL exists to facilitate the development of businesses that benefit equally farmers and firms. In other words, business development should represent the core business of the platforms. Consistently, firms asserted that market opportunities should be considered as a trigger for innovation, thus agricultural research and technology transfer are important only if they are required to exploit business opportunities.

Conversely, the definitions contained in the project design were in line with the vision of the project implementing partners; they conferred on the platform the character of a development initiative in favour of the farmers. This way of looking at the platform comes from the long experience of such organizations in working with farmers through agricultural research and development projects normally funded by international cooperation agencies. In this tradition, farmers perceive themselves and their role in the platform as receptors of the services provided by supporting organizations. They consider processors, retailers, and other market agents as clients, and the supporting organizations as service providers and facilitators of their relations with external actors.

What was the situation in the Continuous Innovation Programme in terms of the degree of fidelity with which the critical conceptual guidelines in the Continuous Innovation Model were incorporated into the main design elements of the Continuous Innovation Programme,

and whether they were perceived by the participants in correspondence with their visions, interests, and tradition of thinking and working?

The discussion in Chapter 6 reveals that the first critical element of the Continuous Innovation model that was reconfigured in the design of the Continuous Innovation Programme relates to the kind of functions that a multi-stakeholder platform should perform, both at departmental and local levels. The model postulates that the Departmental Platform should enhance coordination between multiple organizations to set up agricultural innovation priorities in correspondence with departmental development priorities and policies. However, the Continuous Innovation Programme was designed so that the departmental platform should be used to manage - strategically, technically and administratively - the competitive bidding process for allocating projects in response to local platforms' research and technology transfer mandates. Differences between the model and the programme also appear in the definition of the functions of a local platform. The model proposes that local platforms should accomplish the function of improving coordination and governance in the articulation of research and technology transfer demand and supply. By contrast, the programme specifies that local platforms should bring local actors together to formulate agricultural research and technology transfer demands, and to evaluate whether these demands are being satisfied by the programme through the competitive bidding process to allocate projects.

According to the evidence in Chapter 6, these differences were strongly influential in the fact that the CD-PIC evolved more as a programme steering committee rather than as a departmental platform of the nature and with the functions suggested by the Continuous Innovation model. This had implications for many aspects of the operation of the CD-PIC: i) role and position of its members; ii) development of working procedures; iii) scope of decisions; and iv) the nature of the role of facilitation and how this role was performed. This last point will be discussed in-depth in Sub-section 7.2.3.

Regarding CD-PIC members' roles and positions, the evidence discussed in Chapter 6 shows that - despite all the CD-PIC members agreeing that the platform should be mainly a space where different organizations can generate a shared vision about the main innovation needs in the agricultural sector, and how best to satisfy them, taking advantage of the diverse capacities in the committee (the vision proposed by the model) - the technical and administrative responsibilities with which the platform was endowed in practice guided how the platform members operated. Each member adopted the position of director of a steering committee with competencies to evaluate, approve and take decisions about the overall implementation of the programme, especially the implementation of the competitive process of allocating projects. The evidence suggests that this contradiction has its origins in the long tradition of managing R&D projects through steering committees. The role and position adopted by each member, in addition to being in line with the programme design, was in line with their experience as directors in other steering committees, whether in the context of R&D projects or not. In other words, members not only did what was defined in the programme, but they did what they knew best to do.

A similar analysis can be made regarding the roles and positions adopted by local actors within the Local Platforms. The evidence in Chapter 6 shows that instead of acting as decision takers in local processes of agricultural innovation, local actors (especially farmers) adopted the position of an organized group of beneficiaries. For their part, research and technology transfer providers for the implementation and evaluation of the projects supported by the programme. This position also appears in line with the R&D projects' tradition of organizing farmers and other local actors to deliver services such as training and participatory research.

Continuing this discussion, the evidence indicates that the working procedures developed by the CD-PIC were consistent with its functions as body of technical and administrative direction of the programme. The model proposes that procedures should be those

permitting the process of setting up departmental agricultural innovation priorities, and reducing the transaction costs that this process implies in terms of accessing and producing information, and negotiating priorities. However, the development of procedures in practice was mainly aimed at ensuring the efficiency, accountability, and transparency of projects allocation, thus ensuring the achievement of the Continuous Innovation Programme's expected results. In a similar way, the model proposes that procedures at local level should be those reducing the transaction costs that users (farmers) confront in accessing research and technology transfer services, and those that providers face in adjusting and offering their services in response to users' demands. In this case, the procedures used in practice were those of the project bidding process proposed in the programme design.

Similarly, the evidence discussed in Chapter 6 indicates that because the scope of the decisions taken by the CD-PIC was bounded by the agenda of the Continuous Innovation Programme, no progress was achieved (at the time of this research) in generating a shared vision about agricultural innovation priorities and how these articulate with the development priorities of the department. Although the decisions about the implementation of the programme were taken by consensus, they did not necessarily correspond to the articulation of different visions about innovation. Equally, they did not result in the definition of priorities for departmental agricultural innovation, as suggested by the model.

The discussion so far indicates that neither of the platforms studied in this research evolved as proposed by their respective conceptual models. In other words, the guidelines contained in the models were not reflected "with fidelity" in the collective process of institutional innovation aimed at their formation and operation.

Overall, the evidence suggests that the long tradition among R&D organizations, donors, NGOs and other development agencies, in designing and managing projects as instruments to invest resources in response to farmers' needs, whether technological, commercial,

organizational, or other type, influenced how the R&D projects acted as drivers of the process of institutional innovation. Two aspects of this tradition stand out as affecting how the design of R&D projects incorporated or reshaped the critical conceptual components of the models that were attempted to be put into practice.

First, this tradition equates agricultural innovation with research, technology transfer, and the provision of other services, independently of whether market opportunities or farmers' needs are considered as a trigger for agricultural innovation. Within this tradition, R&D projects are normally designed and implemented to increase poor farmers' income and improve their life conditions, through actions in three main areas. The first area corresponds to the search of solutions to production constraints normally through participatory research and training. Within this area, a project's outcomes are normally assessed using hard indicators such as the percentage of yield increase, the number of farmers accessing new technologies and technology adoption rates. The second area is aimed at strengthening farmer organizations and raising farmers' empowerment and participation. Usually the results are evaluated in terms of the number of farmers participating in the organization, frequency of meetings, development of internal regulations, improvements in the organizational structure, improvement in decision making and working procedures, legal status and level of recognition by local authorities and other actors in the environment. Finally the third area corresponds to actions that seek to articulate farmers to markets, normally competitive urban markets, in order to raise farmers' income through selling better products at better prices. Increase in the number of farmers selling products, in the prices they receive, and in the volumes they sell are the indicators normally used to evaluate the projects' results.

The evidence indicates that this feature in the tradition of designing R&D projects was dominant in both the InnovAndes project and the Continuous Innovation Programme design. In both projects the formation and operation of the platforms, and therefore the

underlying process of institutional innovation, was not defined as a goal in itself. Consequently a clear definition of the outcomes that should arise from the process of institutional innovation was absent. Instead, innovation objectives and outcomes were merged or overlapped with objectives and outcomes related to other core components of the projects: solving farmers' production constraints and improving their access to markets, for instance.

This lack of clarity, whether intentional or not, led the CD-PIC to adopt the function of a body of programme direction, the Local Platforms to adopt the position of an organized group of beneficiaries and research and technology transfer providers for the implementation of the programme, and the facilitating team to adopt the nature of a programme implementing team. Similarly, the two InnovAndes project implementing partners (the R&D organization and the Local NGO), that were both assigned the responsibility of facilitating the formation and operation of ANDIBOL, adopted the role of project implementers, while the other actors (especially participating firms) thought they were being used as collaborators or allies to implement the project and to achieve its outcomes in favour of the farmers.

In this account, it is argued that if institutional innovation processes are expected to be fostered through R&D projects, special attention should be paid in clearly defining the objectives and outcomes of these processes and in separating them from other objectives and processes in the projects' agenda. In the same vein, institutional innovation outcomes and indicators of achievement should be different than those normally used in R&D projects. They might at least reflect changes in the patterns of interaction, information exchange, and learning between actors, as well as reflecting the development of a shared vision, common objectives, practices and procedures.

The second aspect that stands out refers to the definition of boundaries separating who is considered as internal or external to the project. Inside the project are normally the supporting organizations that lead the project, and the farmers who are considered as beneficiaries or as partners, depending on the degree to which they are involved in the definition, implementation and evaluation of activities. Outside the project are the rest of organizations with which the actors from inside interact in order to achieve their objectives (e.g. the objectives of the project). Normally referred to as contextual actors or outsiders, this group involves other service providers, local governments, processors, traders, and other market agents. They are considered as allies or clients depending on the type of relationship that insiders hold with them.

This aspect was particularly present in the InnovAndes project design. The separation between internal and external actors, or between actors with roles and positions and actors without them, was incorporated in the structure of the platform. This separation affected how actors perceived their roles, position, and degree of influence in decision making within ANDIBOL. On the basis of the evidence discussed, it is argued that this tradition of separating roles and positions is not in line with - or undermines - institutional innovation, independently of whether market opportunities or farmers' needs are considered as trigger for innovation. Ideally, within institutional innovation all actors might be considered as internal, the assignment of roles and positions might arise from the interaction between actors and in correspondence with common objectives, and how each actor performs its role in a given position might be regulated by internally defined procedures.

Summarizing, the discussion so far demonstrates that when R&D projects are used to drive processes of institutional innovation, deeply rooted aspects in the tradition of designing and implementing R&D projects affect the degree of fidelity with which the projects design adopts the critical components of the models of institutional innovation that are

being put into practice. They also influence how R&D projects act as drivers of institutional innovation.

7.2.2 The R&D projects design as the rules-in-use affecting the process of institutional innovation.

Bearing these findings in mind, this sub-section moves on to analyze how R&D projects act as drivers of institutional innovation (Barnett, 2008; Edquist, 2010). According to the conceptual framework discussed in Chapter 2, the InnovAndes Project and the Continuous Innovation Programme are considered as the institutional setting in which the process of formation and operation of the platforms took place. The logic for the discussion is as follows: if the action situation corresponds to the collective process of institutional innovation aimed at the formation and operation of ANDIBOL, CD-PIC and Local Platforms, both the InnovAndes project design and the Continuous Innovation Programme design - and how they are perceived by participants in line with their interests, and traditions of thinking and working - can be considered as configuring the set of "rules-in-use" (Polsky and Ostrom, 1999).

For instance, the definition of roles and positions of certain actors and not others within the InnovAndes project was perceived by participants in ANDIBOL as configuring a set of rules that corresponds to what the Institutional Analysis and Development framework defines as boundary, position and authority rules. The evidence showed how a particular type of member perceived its role and position within ANDIBOL and the roles and position of others, depended on whether this type of member was assigned a role and position in the project. For example, the project-implementing partners were perceived by others as having greater control over the decisions made in the platform and as responsible for implementing actions. In the same way, even though conceptually all the participants have the position or the status of "member" in the sense that they are the core actors who make up the platform, the evidence showed, for example, that farmers and R&D

organizations thought that the participating firms should act as buyers of the products offered by farmers, acting basically as "socially responsible firms".

On the other hand, the participating firms perceived that the R&D organization and the Local NGO took the position of partners of farmers in implementing the project, and that the farmers adopted the position of beneficiaries of the project. These positions did not correspond to firms' expectations of having R&D organizations as allies to contact farmers and to develop better business relationships.

Similarly, the evidence discussed in Chapter 5, suggests that the InnovAndes's objectives and intervention strategy were interpreted by the participating actors as what the IAD framework refers as to scope, aggregation and payoff rules. That is, decisions and activities within ANDIBOL should be functional to the agenda of the InnovAndes project (scope rule), contribute to achieving the project's expected outcomes (aggregation rule), and farmers should be the beneficiaries of the decisions and actions of the platform (payoff rule). The implications of this are discussed below in Section 7.3.

Finally, in addition to or as a consequence of the rules discussed above, it seems that the contents of the InnovAndes project were interpreted as defining to whom the platform belongs. The evidence shows that members with no role and position assigned within the project perceived that ANDIBOL belonged to the project implementing partner.

The discussion in Chapter 5 also provides evidence on whether these rules were perceived as a source of conflicts or tensions between ANDIBOL members and whether they were in line or in contradiction with their interests. In this regard, the evidence shows that actors with no roles and position within the InnovAndes project (that is, the participating firms) saw the position, authority, scope and aggregation rules undermining the operation of the platform, and contradicting their vision for ANDIBOL's existence, as well as their interests. For example, the participating firms considered the platform as a space to

develop business and to improve their commercial exchanges with farmers, not as a development initiative aimed at fostering pro-poor agricultural innovation. Consequently they expressed their disappointment regarding the fact that the decisions made and actions undertaken within ANDIBOL were functional to the agenda of the project, rather than to an agenda developed collectively and based on the interests of all.

Conversely, R&D organizations, because their long tradition of working through R&D projects, understood that the InnovAndes project content should guide the operation of ANDIBOL in terms of its objectives, role and contribution of the participating actors, type and scope of actions, and the type of outcomes that should be achieved. For example, they considered ANDIBOL's market chain coordination and process of stimulating joint innovation as instrumental to fostering innovation processes in response to poor farmers' needs.

Regarding the Continuous Innovation Programme design and how its contents were interpreted and adopted by the participating actors as the set of "rules-in-use" guiding the process of formation and operation of the CD-PIC and Local Platforms, two main conclusions can be drawn using the concepts offered by the IAD framework.

First, the fact that the CD-PIC has evolved as a body of technical and administrative direction of the Continuous Innovation Programme, rather than as a body of strategic orientation of agricultural innovation processes in the department, resulted from the influence of the programme design in defining position and authority rules. The evidence discussed in Chapter 6 suggests that the function of direction assigned to a departmental platform in the programme design was adopted by the participating actors in the CD-PIC as a mandatory assignment, giving each member the position of "director" with the authority to evaluate, approve and decide on the entire implementation of the programme. These position and authority rules provided by the Continuous Innovation Programme differ to some extent from how these types of rules are defined in the literature. While

conceptually they are rules defining what the positions and roles that each actor or type of actor plays in a situation are, and what the actions assigned to an actor in a particular position are, the Continuous Innovation Programme assigned position and authority to the CD-PIC as a whole, making no distinction among the participating actors. This also differs from the ANDIBOL case, where the InnovAndes project design was interpreted as giving position, roles and authority to some actors and not to others within the platform.

In the same way, the CD-PIC and the Local Platform members adopted as a mandatory assignment what should be done, by whom, how, with what results, and who was to benefit (scope, aggregation and payoff rules), established by the Continuous Innovation Programme. That is, the programme was to manage technically and administratively the competitive bidding process for allocating projects, and developing and using procedures that ensure the efficiency and quality with which research and technology transfer projects responded to the farmers' needs. Although the function of strategic orientation of agricultural innovation was also assigned to the departmental platform, the evidence shows that this definition was not observed by the CD-PIC members, at least not with the same emphasis, probably because of their experience of working as members of other steering committees.

As in the ANDIBOL case, the discussion in Chapter 6 provides evidence on whether the rules provided by the Continuous Innovation Programme were in line, or in contradiction, with participating actors' attributes and interests. What stands out from the evidence is that all the CD-PIC members adopted the definitions contained in the Continuous Innovation Programme as mandatory assignments or rules establishing the nature and the functions of the platform within the programme.

According to the evidence, there were no tensions or conflicts between members. Two possible explanations can be suggested. First, precisely because the implementation of the programme and the achievement of its expected outcomes became the focus of the

operation of the CD-PIC, decisions and decision making procedures were developed to put in place efficiently what was already defined in the programme. As such, they did not challenge or confront members' different visions about agricultural innovation priorities, nor participants' different interests to be part of the platform. The second explanation has to do with the fact that the definitions in the programme regarding the nature and functions of the departmental platform matched with members' prior experience of working as "directors" in other steering committees.

The discussion so far suggests that when R&D projects are used to drive institutional innovation processes, how the projects affect the process depends on: i) whether the R&D projects design is adopted as the set of rules-in-use of the process of institutional innovation; ii) whether these rules are perceived as a source of conflicts or tensions between participants; and iii) whether they are in line or in contradictions with participants' visions and interests.

Having determined that the tradition of designing R&D projects is a factor influencing how the projects act as drivers of institutional innovation and that the interaction between the projects' contents and the attributes of the participating actors determine whether the projects configure the set of rules undermining or underpinning the process, the next sub-section moves on to analyze the role of facilitation as another factor affecting the process.

7.2.3 The role of facilitation as a factor affecting the process of institutional innovation

According to the conceptual framework discussed in Chapter 2, the facilitation of the relationships and interactions between players (Box 4 of Figure 2.1 in Chapter 2) represents another factor affecting the collective process of institutional innovation aimed at the formation and operation of the platforms under study (Meinzen-Dick et al, 2004; Kruijssen et al 2007, Barham and Chitemi 2008). The framework also indicates that the institutional setting affecting the pattern of interactions and relationships between

participants and its facilitation is given by R&D project design. To analyse the role of facilitation when institutional innovation processes are driven by R&D projects, this sub-section uses the concepts of legitimacy and ambiguity of functions problems in brokering innovation offered by the literature on innovation brokers reviewed in Chapter 2 (Klerkx and Leeuwis, 2008; Klerkx et al, 2009a; 2009b). In particular, this sub-section reflects on how ambiguity of functions and legitimacy problems were perceived by the participating actors in terms of their causes, characteristics and effects.

In the previous section it was mentioned that, by assigning roles and positions to certain actors, the InnovAndes project had configured position and authority rules establishing the particular and relative position and influence (power) of actors within ANDIBOL. A noteworthy case in this regard was the assignation of a triple role and position to one of the participating R&D organizations. According to the project design, this organization should act as facilitator of ANDIBOL, project implementation leader, and research and technology transfer provider.

The evidence discussed in Chapter 5 suggests that ambiguity problems have more (or different) dimensions than those referred to in the literature. According to the point of view of the participating firms, ambiguity problems had to do with how the R&D organization prioritized each of the roles with which it was assigned in the project design. Participating firms stated that this prioritization was strongly influenced by or kept close correspondence to: i) the objectives of the project to improve life conditions of poor farmers through actions to raise farmers' income levels; ii) the vision that the R&D organization has about the platform as a development initiative; iii) the vocation, objectives, and capabilities of the R&D organization as a provider of research and technology transfer services.

According to the participating firms, the combination of these three aspects resulted in the R&D organization prioritizing its roles of project implementation leader and of service provider over its role of facilitation. The firms stated that this prioritization was opposite to

their expectations about the role of the R&D organization within the platform. They expected the R&D organization to prioritize the facilitation of linkages between farmers and firms, fostering information exchange and coordination between both parties. This characterization of the relative importance of the R&D's different roles corresponded to the vision that participating firms expressed about the rationale of ANDIBOL's existence.

Regarding how ambiguity problems were perceived by the R&D organization, the evidence discussed in Chapter 5 suggests that ambiguity problems did not only refer to how the other actors looked at the facilitator, but also to how the facilitator looked at itself, dealing with tensions in balancing its multiple roles. According to the evidence, a first type of tension emerged from the incompatibility of roles and the second had to do with whether each role corresponded to the interests and traditions of thinking and working of the R&D organization.

Regarding the incompatibility of roles, the R&D organization performing the role of facilitator of ANDIBOL was expected to have an impartial and independent position, maintaining the same level of commitment with all the participating actors. However, in a contradictory way, the R&D organization, as provider of research and technology transfer services, was also expected to work closely with the farmers. Furthermore, as project implementing leader, it was responsible for the achievement of the project's expected outcomes. In relation to the second tension, the role of provision of research and technology transfer services not only corresponds to the tradition of thinking and working of the R&D organization, but also to its vision about the rationale of ANDIBOL's existence. This role also challenged the R&D organization experience, capabilities and skills to a much lesser extent than the role of facilitation. In accordance with this observation, the evidence shows that in balancing multiple roles the R&D organization reshaped the roles of facilitation into a service to improve farmers' access to new

technology and profitable markets, using and guiding the platforms in correspondence with this purpose.

In the light of the discussion above, it is argued that, in the ANDIBOL case, ambiguity of functions and legitimacy problems were not only introduced by the InnovAndes project design by assigning multiple roles and positions to the R&D organization, but also came from the centrality that the R&D organization gave to farmers in the objectives of the platform, as well as from the pressure exercised by the R&D organization in constructing and managing the platform as a development initiative to support farmers.

Regarding the role of facilitation in the CD-PIC and Local Platforms case, the Continuous Innovation Programme design established the presence of a technical team to support programme implementation at local and departmental levels. It also facilitated the articulation between members at each level as well as the articulation between the departmental platform and local platforms. According to the literature the assignation of multiples roles at multiple levels could give rise to the emergence of ambiguity of functions and legitimacy problems. However, and in contrast to the ANDIBOL case, no problems were explicitly mentioned by participants when they were asked about their views in this regard.

Why was this? The evidence suggests that the definitions in the programme design regarding the role of facilitation were interpreted and adopted by platform members at both levels as a set of rules in line with their vision about the rationale of the platforms' existence and also in correspondence with their expectation about the role of the technical team. Accordingly, the evidence in Chapter 6 shows that CD-PIC and Local Platform members, in line with their role and position in the implementation of the Continuous Innovation Programme, looked at this team as a programme implementing team and the role of facilitation as a service supporting the platforms technically and organizationally at both levels.

In the same vein, the evidence shows that the technical team, in simultaneously performing the role of programme implementation support team at local and departmental levels and the role of facilitating platform members' articulation within and between platforms, did not see itself confronting ambiguity of functions problems. On the contrary, technical team members considered both roles complementary for the efficient implementation of the programme.

The differences between the two cases indicate that i) the interaction between how the role of facilitation is defined in the R&D project design; ii) the conception and expectations that participants have about the role of facilitation; and iii) the vision, interests, traditions of working and thinking, capacities and skills of the facilitator, all determine to what extent ambiguity of functions and legitimacy problems arise in practice.

The discussion so far has been focused on analyzing the conceptual models, the R&D projects design, the attributes of the different participants, the role of facilitation (Boxes 1, 2, 3 and 4 of Figure 2.1 in Chapter 2) and the interaction between them, as factors affecting the process of institutional innovation aimed at the formation and operation of ANDIBOL, CD-PIC and PIC Local Platforms (Box 5 of Figure 2.1 in Chapter 2). The next section discusses the effects of these factors on the results of these processes of institutional innovation (Box 6 of Figure 2.1 in Chapter 2).

7.3 Effects on the results of the processes of institutional innovation

According to the conceptual framework discussed in Chapter 2, the process of institutional innovation should result in the development of procedures (operational rules) enabling ANDIBOL, CD-PIC and PIC Local Platform members to accomplish three generic functions: i) demand articulation; ii) network composition; and iii) innovation process management. This section analyzes the effects of the factors discussed in the previous sub-sections on the development of such procedures (Box 6 of Figure 2.1 in Chapter 2). As discussed in Chapter 2, the analysis uses conceptual insights offered by two new

theoretical developments associated with the literature on innovation and innovation systems: the literature on innovation brokers (Klerkx and Leeuwis, 2008; Klerkx et al, 2009a; 2009b), and the literature on boundary organizations (McNie et al, 2008; Kristjanson et al, 2008; Cash et al, 2003).

7.3.1 Effects on demand articulation

Regarding the ANDIBOL case, probably the first effect of the InnovAndes project on the institutional innovation process, aimed at in the formation and operation of ANDIBOL, was reflected in the emergence of a hole in the structure of coordination and information exchange relationships between the different types of actors composing the platform. According to the conceptual insights discussed in Chapter 2, the pattern of interactions and relationships between the different participating actors determines the extent to which different innovation visions and needs are articulated within the process of innovation. In this light it can be argued that the configuration taken by the structure of the relationships of coordination and information exchange in ANDIBOL has not been especially conducive to demand articulation. The evidence in Chapter 5 shows that the absence or weakness of the relationships between ANDIBOL members affected the platform both at strategic and operational levels. At strategic level, ANDIBOL members were not capable of developing a shared vision about whether ANDIBOL should be a space where different market chain actors and other supporting organizations are brought together to foster market–driven innovation processes in response to farmers' needs; or whether, on the contrary, business development should be the core business of the platform, and therefore, innovation processes should be oriented to solve business development constraints. At an operational level, no procedures were developed to capture, analyse and share members' different innovation needs to feed into common objectives and a shared working agenda. In other words, the process of institutional innovation did not result in the development of procedures to articulate the demand and supply of products, nor in the procedures to

articulate the demand and supply of research and technology transfer services, as proposed by the Papa Andina model.

By contrast, the effects of the Continuous Innovation Programme on the function of demand articulation and on the development of procedures were totally different from the ANDIBOL case. The evidence discussed in Chapter 6 shows that the function of demand articulation, understood as the articulation of different visions of and needs for innovation, disappeared in both the CD-PIC and the Local Platforms as a consequence of the roles and position adopted in the implementation of the bidding process for allocating projects. Within this framework the function of demand articulation was reshaped as the function of capturing and responding to local actors' innovation needs through research and technology transfer projects. The procedures developed and used were those ensuring the efficiency and quality with which these needs were answered. However, in this case, it is argued that the emphasis put on the implementation of the bidding process inhibited the development of procedures to articulate CD-PIC members' different visions and priorities about agricultural innovation in correspondence with departmental development priorities, as proposed by the Continuous Innovation Model. According to the evidence discussed in Chapter 6 this aspect was one of the reasons why CD-PIC members with no direct stake on the Continuous Innovation Programme (especially departmental government representatives) felt their expectations unsatisfied.

7.3.2 Effects on network composition

The literature on innovation brokers discussed in Chapter 2 refers to network composition or formation as a function of facilitation of linkages between relevant actors for innovation (Klerkx and Leeuwis, 2009). This function includes actions associated with the search, analysis and selection of possible partners within the context in which the network operates, as well as contacting and integrating them into the network. The evidence discussed in Chapters 5 and 6 suggests that how this function is performed depends on: i)

the pattern of interaction and relationships between participant actors as well with actors outside the network; and ii) the level of members' commitment to the network's objectives and actions.

For example, the participating firms in ANDIBOL considered that the lack of connectedness, coordination and information exchange between members, and the absence of a shared vision about the rationale of ANDIBOL's existence, decreased the level of activity and cohesiveness of the platform and inhibited the search and entry of other relevant actors. In this sense, they asserted that one of the major effects was the reduced number of farmer organizations and firms participating in the platform (few demanders and few suppliers of products), and the absence of supporting organizations with capacities to respond to firms' innovation needs. Firms also asserted that, in addition to the lack of clearly and formally defined procedures to capture and prioritize different stakeholders' innovation needs, ANDIBOL lacked procedures to identify, select and link potential buyers and sellers of products and other services providers according to the demands (whether commercial or technological) of all the members. This evidence indicates that the process of institutional innovation did not result in the development of procedures to facilitate the linkages between providers and buyers of products, nor in procedures to facilitate the linkages between relevant actors for innovation bringing R&D organizations, NGOs and other supporting organizations together in the provision of research and technology transfer services and other types of support, as originally proposed by the Papa Andina model.

Regarding the CD-PIC and PIC Local Platforms the outcome is different. The evidence discussed in Chapter 6 shows that platforms at both levels were not formed and did not evolve as networks but as structures for the implementation of the programme. CD-PIC and Local Platform members agreed that the type and number of members composing the platforms was appropriate enough to accomplish their role and position in the

implementation of the bidding process for allocating projects. This explains why neither significant interactions nor information exchange about matters beyond the implementation of the programme occurred between platforms members and with other organizations outside the platforms. In this account it is argued that within the CD-PIC the development of procedures to facilitate the linkages between relevant actors to set up departmental agricultural innovation priorities was not perceived as necessary, at least for the implementation of the programme. Similarly, at the Local Platform level, the search, analysis and selection of partners was made using the procedures of the bidding process and was aimed at finding research and technology transfer providers that best responded to farmers' needs. On the basis of this discussion it can be said, therefore, that the process of institutional innovation aimed at the formation of the platforms at departmental and local level did not result in the development of procedures for network composition of the nature proposed by the Continuous Innovation Model.

7.3.3 Effects on innovation processes management

According to the literature discussed in Chapter 2 (Klerkx et al, 2009), innovation processes management involves enhancing the alignment of actors with different objectives, institutional norms, values, incentives, and reward systems. This is a continuous activity that involves boundary management to: i) build trust; ii) establish working procedures; iii) foster learning; and iv) manage conflict and intellectual property (Klerkx et al, 2009, p. 413; Devaux et al, 2010, p. 9). This sub-section discusses in-depth the effects of the tradition of designing R&D projects, and of the design acting as rules-in-use, on the function of innovation process management and on the development of its corresponding procedures (the second point listed above). To put the discussion in a theoretical perspective, this sub-section uses the concepts of credibility, salience and legitimacy of the information available for decision making (Cash et al., 2003), and the concepts of

communication, translation and mediation (McNie et al, 2008; Kristjanson et al, 2008) offered by the literature on boundary organizations, discussed in Chapter 2.

Effects on innovation processes management within ANDIBOL

On the basis of the evidence discussed in Chapter 5, it is argued that the combined and overlapping influence of the lack or weakness of direct connections between all the participating stakeholders (especially between farmers and firms) and how the R&D organization performed its role of facilitation inhibited the development of ANDIBOL's procedures for innovation process management.

According to the evidence, the lack of direct interaction between farmers and firms, and the fact that the facilitating R&D organization constituted the only channel of information, meant that the availability of relevant information for decision making depended almost exclusively on the capacities of the R&D organization to capture, process and share it. The evidence showed that the R&D organization, due to its nature and experience, possessed strong capacities in managing information from and toward farmers, but conversely, not from and toward firms, nor information from the market side. This aspect, in the addition to the differences in perception between firms, R&D organizations and farmers about the rationale of ANDIBOL, led to concerns about the credibility, salience and legitimacy of the information available for decision making.

All these aspects were pointed out as causes that ANDIBOL lacked, or did not have the ability, to develop procedures for efficiently managing information about the supply of and demand for products, nor to capture stakeholders' different innovation needs. According to the literature on boundary organizations, procedures for managing information can be seen as complex "boundary objects" (McNie et al, 2008; Kristjanson et al, 2008; Cash et al., 2003) that an innovation broker and stakeholders jointly create to produce, share and use information and knowledge. By embodying the knowledge and experiences of the people

involved in their production, boundary objects increase the likelihood that the information produced and used will be salient, credible and legitimate (Cash et al, 2003; McNie et al, 2008).

Following these ideas, the ability to develop boundary objects depends on the existence of certain conditions enabling continuous interaction between stakeholders. As mentioned in the preceding sections of this chapter, these conditions were strongly influenced in the ANDIBOL case by three main factors: i) how the different participating stakeholder perceived the InnovAndes project design as configuring a set of boundary, position, authority, scope, and payoff rules; ii) the multiplicity of functions with which the facilitating R&D organization was assigned; and iii) how the R&D organization perceived and performed its role as facilitator in accordance with its interests and tradition of working and thinking.

In the light of the evidence discussed in Chapter 5, it seems that these three sets of factors, which in turn gave rise to the emergence of the hole in the structure of coordination and information exchange relationships between ANDIBOL members, were also the causes that gave rise to the emergence of managerial gaps. Klerkx and Leeuwis (2008) describe managerial gaps as the lack of competences - or insufficient competences - in setting up innovation projects. In the ANDIBOL case, these managerial gaps were referred as to the lack of abilities to develop procedures to make collective decisions over actions that should be carried out in response to a specific innovation need (whether commercial or technological); and decide which were the most important, whether they were within the capabilities of the platform members, and whether they corresponded to the purposes and scope of the platform. The evidence indicates that such decisions were guided or were based on what the project design established in relation to the activities that should be implemented, how and by whom, with what results and who should benefit from them. In this regard, the different stakeholders expressed that as a consequence of the structural hole

and managerial gaps (lack of procedures collectively developed), ANDIBOL had been unable to define its own working agenda and that its operation had been dependent almost exclusively on the capabilities and skills of the facilitating R&D organization.

Effects on innovation processes management within the CD-PIC and PIC Local Platforms

According to the evidence discussed in Chapter 6 and on the basis of the preceding discussion, it seems that the definition of innovation process management and the concept of boundary work, as referred as to in the literature, do not apply in this case. First, because the implementation of the Continuous Innovation Programme became the centre of the rationale of the existence and operation of the CD-PIC, Local Platforms and of the Technical Secretariat, in practice, what was managed was an agricultural research and technology transfer project instead of an institutional innovation process as proposed by the Continuous Innovation Model.

Second, no boundary work took place, simply because there were no boundaries to manage. According to the literature, central to the concept of boundary management is the presence of boundaries separating stakeholders (cultural, social, economic boundaries), and the presence of a boundary agent translating, communicating and mediating information and stakeholders' different attributes (values, interests, and tradition of thinking and working) across the boundaries (Cash et al, 2003; Devaux et al, 2010). The evidence in Chapter 6 shows that none of these two elements were present.

The following explanation can be suggested in this regard. Boundaries between the CD-PIC members and between PIC Local Platform members were blurred because platforms at both levels were converted into operational structures for the implementation of what was already defined in the programme design. As such, decisions within the each platform did not involve the alignment of members' different visions and interests and no translation,

communication or mediation took place, within or between platforms. Under this scenario there was no room for the presence of a boundary agent as referred to in the literature, and instead of that, the Technical Secretariat adopted operational functions associated with the implementation of the programme.

Although the CD-PIC´s internal regulations (functions, and rules of composition and membership) and procedures (for decision-making, and the conduct of the competitive process of project allocation) were jointly developed by the members and the Technical Secretariat, they cannot be considered as boundary objects. They were not developed to facilitate heterogeneous actors to co-produce useful information and build effective information flows to address different interests, concerns, and perspectives. In this respect, the evidence shows that the CD-PIC´s internal regulations and procedures were defined in correspondence with the assignment of implementing the programme. As such they embodied members´ different ideas about how to better accomplish such responsibility, but they did not necessarily reflect different visions and interests. In terms of the attributes of the information used and exchanged, the evidence shows that members agreed in assessing it as highly credible, salient and legitimate. However it is important to note that the information content and working procedures were built almost exclusively on the basis of what was defined in the Continuous Innovation Programme.

7.4 Conclusions

The discussion in this chapter has shown that by combining and organizing key conceptual insights in the literature on innovation systems, collective action, institutional analysis, innovation brokers and boundary organizations, using the conceptual framework discussed in Chapter 2, it has been possible to analyze in a comprehensive manner and in-depth the process of formation and operation of ANDIBOL, the CD-PIC and PIC Local Platforms as a collective action process of institutional innovation, and to analyze the factors affecting the process when R&D projects are used as process drivers.

This concluding section organizes the discussion above to answer the first and second questions of this research.

What are the factors influencing how and with what effects R&D projects act as drivers of institutional innovation conducive to pro-poor agricultural innovation?

The discussion in this chapter indicates that neither of the platforms studied in this research evolved as proposed by their respective conceptual models. In other words, the guidelines contained in the models were not reflected "with fidelity" in practice, that is, in the collective process of institutional innovation aimed at the formation and operation of the platforms. Two main interrelated factors stand out as responsible for this situation:

i) the tradition of designing and managing R&D projects; and

ii) the prescriptive nature of the R&D projects defining what should be done, by whom, how, with what results, and for the benefit of whom.

Two main aspects of the tradition of designing and implementing R&D projects were identified as of relevance regarding the fidelity with which the critical elements of the conceptual models were included in the R&D projects' design:

i) this tradition equates agricultural innovation with research, technology transfer, and other services provision in response to farmers' needs, whether market opportunities or farmers' needs are considered as triggers for agricultural innovation.

ii) this tradition establishes boundaries separating who is considered as internal or external to the project.

It is argued that this way of looking at innovation is not comprehensive enough to consider the complexity of the interactions and relationships between multiple actors needed for innovation, the procedural nature of innovation, and the complexity of the rules and

procedures that enable actors to act collectively. As was demonstrated in Section 7.2, in both projects the formation and operation of the platforms, and therefore the underlying process of institutional innovation, was not defined as a goal in itself and consequently a clear definition of the outcomes that should arise from the process of institutional innovation was absent. Instead of that, innovation objectives and outcomes were merged or overlapped with objectives and outcomes related to other core components of the projects: solving farmers' production constraints and improving their access to markets, for instance.

In the same vein, it is argued that the tradition of separating roles and positions is not in line with the systemic nature of the processes of institutional innovation. Ideally, within these processes all actors might be considered as internal, the assignment of roles and positions might arise from the interaction between actors and in correspondence with common objectives. Finally, how each actor performs its role in a given position might be regulated by internally defined procedures.

Regarding the prescriptive nature of the R&D projects, the discussion in Section 7.2 demonstrates that R&D projects' content might represent a source of conflicts and tensions depending on whether definitions are negotiated and then adopted by participants as the rules that should guide the process of institutional innovation in which they are involved. To what extent participants achieve consensus and therefore to what extent R&D projects' content are adopted as guiding rules by some or all the participants is a function of the degree of heterogeneity in visions, expectations and traditions of thinking and working among the participants. For example, due to differences in vision, expectations and tradition between firms on the one hand and the R&D organization and farmers on the other, no consensus was achieved regarding whether ANDIBOL's functions and corresponding procedures for demand articulation, network composition and innovation process management should be those proposed by the Papa Andina Model; or, on the

contrary, whether they should correspond to what was established in the InnovAndes project as to what should be done, by whom, how, with what results, and for the benefit of whom.

By contrast, no tensions and conflicts were experienced in the Continuous Innovation Programme. On the contrary, the programme definitions were adopted as mandatory and were the basis on which participants built and aligned their understandings and expectations about the rationale of the platforms' existence. The discussion in Section 7.2 indicates that the way in which the Continuous Innovation Programme design reconfigured what was proposed by the Continuous Innovation Model, defining platforms' functions and procedures as services to capture and respond local actors' innovation needs through research and technology transfer projects and to ensure the efficiency and the quality with which these needs are responded, was in line with participants' understanding about agricultural innovation processes and with their experience in managing R&D projects, however there was no wider engagement with departmental innovation needs.

How do institutional innovation processes driven by R&D projects affect the facilitation of the interactions and relationships between the multiple actors involved?

Regarding the role of facilitation in institutional innovation processes, the discussion in this chapter indicates that R&D projects are perceived by the participating actors as a set of rules defining the nature of the role of facilitation, how this role should be performed, and by whom. The extent to which these rules represent a potential for ambiguity of functions and legitimacy problems depends on:

i) whether the role of facilitation is defined as functional to the implementation of the project and to the achievement of its expected outcomes;

ii) whether the facilitator is assigned with other roles linked to the implementation of the project; and

iii) the degree of authority with which the facilitator is endowed in comparison with the other participants.

On the other hand, the extent to which ambiguity of functions and legitimacy problems effectively take place and affect, depends on:

i. whether the rules in the project regarding the role of facilitation are perceived by the participating actors as opposite to or in line with their visions and interest;

ii. the conception and expectations that the participants have about the rationale of the role of facilitation; and

iii. the extent to which the rules in the project match with the vision, interests and traditions of working and thinking of the facilitator.

Taking into account that R&D projects are, and will be in the short and medium term, one of the most important instruments to invest and intervene in strengthening agricultural innovation systems in developing countries, and considering that R&D organizations are increasingly called to work collaboratively with a wide range of actors as part of networks for innovation, the conclusions above may have implications for the design and management of R&D projects when they are used as drivers of institutional innovation processes.

In this sense, this study argues that the task of designing R&D projects implicitly has a prescriptive dimension in the sense that they define certain rules and procedures that will have later, in the implementation phase, a strong influence on the process of institutional innovation entailed in the formation and operation of networks for innovation. The implications for the design of R&D projects and for R&D organizations are discussed in Chapter 8, which concludes the thesis by addressing the third question of this research.

Chapter 8 Conclusions

8.1 Introduction

This research has sought to contribute theoretical and practical insights to the Bolivian System of Agricultural, Livestock and Forestry Innovation in its current efforts aimed at the formation and operation of departmental and local networks for pro-poor agricultural innovation across the country. Contributions are also in line with the interest of the International Potato Centre and other international research centres of the CGIAR system engaged in enhancing agricultural research outcomes and impacts through networks for innovation. They also map on to current debate regarding the need for effective multi-organizational forms to organize agricultural technology promotion and the process of innovation in developing countries.

Considering that R&D projects are, and will be in the short and medium term, one of the most important instruments to invest in strengthening agricultural innovation systems in developing countries, this study directed its attention toward two R&D project-driven attempts to foster the establishment and operation of multi-organizational forms of collaboration within the Bolivian context of agricultural innovation. These particular initiatives represent an institutional innovation, the dimensions of which were analysed in Chapters 5, 6 and 7. The overall findings are summarised in this introduction.

Chapters 5 and 6 discussed the Papa Andina Model and the Continuous Innovation Model of multi-stakeholder platforms, as proposals of new forms of multi-organizational collaboration to foster agricultural innovation in the Bolivian agricultural sector. Both models were put into practice through R&D projects: the InnovAndes Project and the Continuous Innovation Programme respectively. In this sense, these projects were used as instruments to drive the institutional innovation process entailed in the formation and operation of multi-stakeholder platforms as proposed in their respective conceptual models.

Despite similarities and differences in the critical conceptual elements contained in each model and in the content of the design of both R&D projects, the discussion in Chapters 5 and 6 arrived at a general finding, which can be encapsulated as follows.

When institutional innovation processes are driven through R&D projects, the extent to which these processes evolved as proposed in the conceptual models depends on: i) the extent to which the critical components of the conceptual models are incorporated and/or reshaped in the design of the projects; ii) the extent to which projects' contents correspond to the attributes (values, interests, and traditions of thinking and working) of the participants involved in the processes; and iii) how each participant constructed its own understanding of the process of institutional innovation as it related to and interacted with the other participants.

This general finding was then discussed and extended in Chapter 7 in the light of the key conceptual insights provided by the literature on innovation systems, collective action, institutional analysis, innovation brokers and boundary organizations, which were combined and organized within the conceptual framework discussed in Chapter 2. The focus of the analysis was on: i) the contents of the R&D projects and their respective conceptual models; ii) the facilitation of the interactions and relationships between participants; iii) the attributes of the participants; and iv) how the interaction of these three elements affected the results of the process of institutional innovation entailed in the formation and operation of the multi-stakeholder platforms.

The results of the analysis of the four elements above were organized in the conclusion section of Chapter 7 around the first and second question that this research sought to answer: What are the factors influencing how, and with what effects, R&D projects act as drivers of institutional innovation conducive to pro-poor agricultural innovation? How do institutional innovation processes driven by R&D projects affect the facilitation of the interactions and relationships between the multiple actors involved?

Regarding the first question, it was concluded that two main interrelated factors stood out as responsible for the fact that none of the multi-stakeholder platforms included in this research evolved as proposed by their respective conceptual models:

ii) *The tradition of designing and managing R&D projects.* It was concluded that the tradition of equating agricultural innovation with research, technology transfer and other services provision and assigning roles to the participants as internal or external to the project is not comprehensive and appropriate enough for the complexity of the interactions and relationships between multiple actors needed for innovation, the procedural and systemic nature of innovation, and the complexity of the rules and procedures that enable actors to act collectively.

iii) *The prescriptive nature of the R&D projects defining what should be done, by whom, how, with what results, and for the benefit of whom.* It was concluded that the extent to which the R&D projects' represent a source of conflicts and tensions among participants and the extent to which R&D projects' contents are adopted as guiding rules by some or all the participants, is a function of the degree of heterogeneity in visions, expectations and traditions of thinking and working among the participants.

Regarding the second question, it was concluded that, depending on the tradition followed to design and implement R&D projects, these projects also provided prescriptive definitions about the nature of the role of facilitation, how this role should be performed, and by whom. To what extent these definitions lead to ambiguity of functions and legitimacy problems depends on the interactions between how the role of facilitation is defined in the R&D project design, the conception and expectations that participants have about the role of facilitation, and the vision, interests, traditions of working and thinking, capacities and skills of the facilitator.

R&D projects have been, are, and will be in the short and medium term, one of the most important instruments to put into practice conceptual models of institutional innovation aimed at strengthening the agricultural innovation system in Bolivia and in other developing countries as well. It is therefore argued that the answers to the questions above have theoretical and practical implications for designing and managing R&D projects when they are used to drive institutional innovation processes. The discussion of these implications is the main focus of this chapter, addressing the third question of this research:

> **What are the theoretical and practical implications for the design of conceptual models and of R&D projects, when they are used to drive institutional innovation processes aimed at fostering pro-poor agricultural innovation?**

The rest of this chapter is organized as follows. Section 8.2 discusses the theoretical and practical contributions of this research regarding the use of the innovation systems and collective action approaches in and for R&D projects-driven processes of collective institutional innovation. Following that, Section 8.3 discusses the empirical and methodological contributions of this research for conducting in-depth action-research case studies of ongoing collective action processes of institutional innovation. Then Section 8.4 revolves around the theoretical and practical considerations that, according to the findings of this research, should be borne in mind in designing and implementing conceptual models and R&D projects aimed at fostering institutional innovation processes. Finally, Section 8.5 proposes ideas for further research and Section 8.6 presents concluding remarks regarding the relevance of this research for the current efforts of strengthening the Bolivian system of agricultural innovation.

8.2 Theoretical and practical contributions for the use of the innovation systems and collective action approaches

As discussed in Chapter 2, the literature typically reports on the use of the innovation systems approach mainly as a theoretical framework to explore and explain different approaches to agricultural innovation, in order to inform changes in innovation policies mainly at regional and national levels. However, the literature also reports that less progress has been achieved in understanding how innovation systems ideas should be adapted, adjusted, and ultimately used to study innovation processes in developing countries' different agricultural contexts, and even less with action-oriented purposes. This research illustrates the use of the critical conceptual elements in the innovation systems approach to study institutional innovation processes at much lower level: the departmental and local levels in the case of the CD-PIC and PIC local Platforms and at the level of a particular market chain in the case of ANDIBOL. Additionally, this research is an example of the practical use of the innovation systems approach to study innovation processes in a participatory way; that is, involving the actors that are engaged in innovation in the research process.

As discussed in Chapter 2, this research combined conceptual insights from the innovation systems and collective action approaches to explore the formation and operation of the CD-PIC, PIC Local Platforms, and ANDIBOL as a collective institutional innovation process. Because of the focus on institutions, heterogeneity and facilitation in the research questions, and because neither the literature on innovation systems nor the literature on collective action offers guidelines on how to study these concepts, this research adapted concepts from the literature on institutions and institutional analysis, innovation brokers and boundary organizations to fill this gap. The rest of this section discusses the contributions of this research by adopting this approach.

The innovation systems approach distinguishes itself from other approaches by considering innovation as a process rather than as a product and by focusing its attention on the complexity of the process of innovation (Barnett, 2006; Johnson et al, 2003; Edquist, 1997). This conceptual perspective informed the focus of this research: the formation and operation of the multi-stakeholder platforms was analyzed as a process of innovation encompassing a wide array of determinants such as the attributes of the individual actors involved, their interactions, and the influence of the R&D projects used to drive the process of innovation.

Similarly the relational and interactional nature of the process of innovation highlighted in the innovation systems approach (Clark, 2002; Johnson et al, 2003) was used as a conceptual insight to analyze the patterns of relationships of coordination and information exchange between the members of the multi-stakeholder platforms as well as to analyze their patterns of participation. In the same vein, the importance that the innovation systems approach assigns to the institutional dimension of the processes of innovation (Hall et al, 2006; Spielman, 2005; Edquist, 2010; Lundvall, 2002; Nelson and Nelson, 2002) was used as a conceptual insight to see the extent to which the design of the R&D projects configured the rules-in-use (Polsky and Ostrom, 1999) affecting the process of institutional innovation aimed at the formation and operation of the multi-stakeholder platforms considered in this research.

As stated in Chapter 2, most of the literature on collective action is concerned with groups formed by one type of actor (i.e. farmer or village organization acting collectively to produce and sell a certain product, demanding/contracting services or managing some common natural resource) and how this kind of group overcomes collective problems by developing internal rules, mobilizing resources, coordinating joint activities and sharing information (Poteete and Ostrom, 2004; Meinzen-Dick et al, 2004). Authors have also devoted their efforts to understand how different factors influence collective performance

of this type of group and how external agents help them (Poteete and Ostrom, 2004; Agrawal, 2001). The degree of homogeneity among the members of a group, the institutional setting in which collective action take place and the role of external agents encouraging and supporting collective actions, are commonly referred to in the literature as three of the main factors affecting collective action (Poteete and Ostrom, 2004; Agrawal, 2001; Meinzen-Dick et al, 2004)

By studying the formation and operation of multi-stakeholder platforms as a R&D project-driven process of collective institutional innovation, this research expands the frontiers of explaining the factors affecting collective action in three main aspects. First, while the literature observes that there is an unsolved debate regarding whether heterogeneity affects positively or negatively collective action, this research focused on how to study heterogeneity when it is considered a desirable condition for collective action. Second, while most of the literature reports on studies analyzing the rules and norms affecting the collective performance of a group, this research has focused on the factors affecting the development of rules and norms that enable group members to act collectively. And third, much of the literature on collective action analyzes the role and contribution of external agents from governmental bodies, NGOs or development projects in encouraging and supporting collective action. Differently, this research has aimed at cases where these types of agent acted alongside farmers, firms and service providers as part of the same group.

In this regard, this thesis contributes to the study of innovation and collective action processes when such processes are driven through R&D projects. First, it is argued that special attention should be put on the institutional dimensions of the projects in order to explore the extent to which the project design configures or defines rules affecting the behavior of the participants in the process of collective innovation, whether these rules correspond to the attributes of the participants and, consequently, how they are differently adopted and shaped by the participants as the process evolves. This approach opens a new

branch of research in agricultural innovation studies in developing countries: it shifts the traditional focus from studying R&D projects as instruments to invest resources in agricultural research and technology transfer (referred to by Klerkx and Leeuwis (2009) as the "hardware" and "software" component of innovation) to considering the role of these projects in stimulating agricultural innovation in a broader sense; i.e. their contribution in building the "orgware" component required for innovation (Smits, 2002).

The second contribution of this thesis refers to the study of heterogeneity as a desirable condition for innovation. This research shows that whether heterogeneity stimulates or prevents the innovation process depends largely on the framework of rules in which the process takes place. In this regard, it is argued that when innovation and collective action studies are aimed at ongoing R&D project-driven processes of collective innovation, special attention should be put on the attributes of the participants (values, interests, and traditions of thinking and working), on the institutional dimension of the projects (the set of rules provided by the project design), and on whether the interaction between the two results in the articulation of different views and expectations about the process of innovation.

The third contribution is concerned with the study of the role of facilitating agents in innovation and collective actions processes. Although the literature reports on the role and contributions of external agents in facilitating the establishment of enabling conditions for actors to work collectively, both inside the group and with other actors in the environment (Kruijssen et al 2007, Barham and Chitemi 2008), it does not explicitly refer to how to study this role and the factors affecting how this role is performed. This research provides a practical example of the use of concepts in the literature on innovation brokers and boundary organizations to analyze the role of facilitation as a factor affecting the patterns of interactions and relationships between the participants involved in the process of collective innovation. At the same time, this thesis also contributes to the literature on

innovation brokers with insights about the occurrence and effects of ambiguity of functions and legitimacy problems in the particular case of R&D project-driven process of collective innovation and when the brokering role is not performed by an actor external to the group. The findings of this thesis indicate that when R&D projects are part of the institutional setting in which the process of innovation takes place, and when the brokerage or facilitation role is played by an actor that at the same time forms part of the group involved in the process of collective innovation, the study of ambiguity of functions and legitimacy problems should consider how the role is defined in the project design. It should also consider how it is perceived not only by others but also by the facilitator, in correspondence with their attributes and interests.

Finally, the fourth contribution of this research refers to the practical use of essential conceptual components of the Institutional Analysis and Development framework (Polsky and Ostrom, 1999). While the literature normally reports on the use of the IAD framework to study the collective and sustainable management of natural resources and related policies, this research adapted and applied these concepts as analytical tools to study the institutional dimension of the R&D projects used to drive processes of collective innovation, a field that has not been addressed in the literature about innovation, collective action, or in literature concerned with the use of the IAD framework. The findings of this research demonstrate that the IAD framework can be used to systematically explore the extent to which the definitions in R&D projects are adopted by the participating actors as position, boundary, scope, aggregation, information and pay-off rules, and therefore the extent to which these rules affect the process of collective innovation.

The discussion has so far highlighted the contributions of this research for the conceptual design of in-depth investigation of collective action processes of innovation, addressing partially what Horton et al (2009, p. 106) noted as one of the knowledge gaps concerning the type of research that is needed to expand knowledge about partnerships in international

agricultural research for development: "in-depth case studies employing an action-research approach would be especially useful to understand how partnerships are constructed by participating actors, how they are negotiated and re-negotiated in practice through the interactions of participants, and how these interactions lead to sets of rules, norms and ethical practices". The next section discusses the contributions of this thesis for the conduct of such in-depth case studies employing an action-research approach.

8.3 Empirical and methodological contributions

In contrast to other conceptual studies reported in the literature on innovation and also different from other descriptive or evaluative studies, this thesis constitutes a detailed and nuanced study of innovation in action and provides empirical and methodological contributions for the conduct of in-depth action-research case studies of ongoing collective action processes of institutional innovation. This section summarizes such contributions, proposing three principles resulting from the learning gained from the application of the methodology discussed in Chapter 3: i) research should be seen as a progressive process of construction of useful knowledge; ii) the researcher is a facilitator of the process and the participants should be seen as sources of knowledge; and iii) the design and use of instruments to gather and share information should be functional to the construction of knowledge and should be adjusted as the process of knowledge construction evolves.

The first methodological principle suggests that when the subject of study is an ongoing collective action process, the research should be also designed as a collective process of knowledge construction useful for those involved in the study (Winter and Munn-Giddings, 2002; Bowling, 1997; Abbott, 1998). This implies that the research's purpose and procedures should be in line with the participants' expectations regarding the usefulness and benefits of the research. This aspect entails risks and advantages that the researcher should balance and manage during the progress of the research. On one hand, the risks refer to the possibility of losing the central objectives of the research and the loss

of independence in relation to the research subject. On the other hand, the advantages consist in participants engaging in and committing to the research and therefore they are willing to provide more and better information because they consider that the investigation will benefit the collective process in which they are involved.

Two elements of the methodological design discussed in Chapter 3 appear as useful to deal with the risks and advantages above. First, conducting a workshop at the beginning of the fieldwork phase to share the objectives and the theoretical basis of the research contributes to: i) gathering participants' expectations regarding the usefulness and benefits of the research; ii) clarifying what should be expected from the research and what not; iii) achieving an initial understanding among participants about the theoretical perspective guiding the study and about the objectives; iv) clarifying the role and position of the researcher and participants; and v) encouraging commitment and involvement of the participants.

The second element of this research's methodology - that it may be important to deal with the risks and advantages entailed in conducting research as a collective process of knowledge construction - refers to the use of interviews, meeting observation, workshops and focus group sessions not only as techniques to gather and deepen information, but also to share the progresses and preliminary findings and to link them with the participants' expectations about the research, to recall the objectives and theoretical basis of the research, and to maintain participants' commitment and active involvement.

The preceding discussion articulates with the second methodological principle outlined in the first paragraph of this section: the researcher as facilitator of the process and the participants as a source of knowledge. In this regard, some elements of the methodology followed in this research stand out as relevant.

For example, the preparation of summaries of the information gathered through the electronic questionnaires, and sending the transcript of the interviews asking each

interviewee for their comments, suggestions and additions, were effective in reinforcing the participants' roles within the research as sources of knowledge rather than as sources of information. The organization of workshops also proved to be effective in this respect, creating opportunities for an open debate that allowed participants to articulate different perceptions about the innovation process in which they were involved. In order to avoid legitimacy and lack of neutrality problems, as researcher and facilitator at the same time, I needed constantly to reaffirm and demonstrate my commitment with the process of knowledge construction and with the objectives of the research, providing clear and unbiased information to all the participants, and setting the conceptual basis for discussion.

Finally, the third methodological contribution of this research for conducting in-depth action-research investigation of ongoing collective action processes of institutional innovation indicates that when research is conceived as a collective process of knowledge construction, the design and use of the instruments for gathering, analyzing and sharing information should be functional to the construction of knowledge and should be adjusted as the process of knowledge construction evolves (Chataway and Joffe, 1998). The methodology described in Chapter 3 can be seen as an example of putting this into practice: it considered the construction of knowledge as an additive process in which each step of the research generates the knowledge basis for the design and implementation of the next step. For example, the information collected through the electronic questionnaire was converted into knowledge when it was discussed in-depth during interviews in the light of the theoretical basis guiding the study. This knowledge was then tested and adjusted during meeting observation, adding new knowledge which was then analyzed and deepened in the workshops with all the participants. In other words, knowledge was constructed, added and reconstructed with the participants during the course of the research.

The contributions of this research were recognized when the results of the field work phase were presented to the ANDIBOL and CD-PIC members:

"This study was not a traditional external evaluation or theoretical investigation. It helped us to strategically analyze our evolution, problems and successes and to learn from our own experience. It was something like an "X-ray image" of the CD-PIC captured from a perspective of innovation that we did not consider before. However it would be good to have some indications on how to overcome the problems we identified or about what we need to change in our structure and operation to be more effective in fostering agricultural innovation. Now we are looking forward for the final document of the thesis, hopefully in Spanish" (Representative of the Public University, member of the CD-PIC).

"This work helped us to analyze and understand what we did well and what not, also to talk openly, transparently and constructively about our problems, potential, and challenges. However it does not give us proposals of solution or suggestions about what we need to do to improve the operation of the platform. Probably this last point was not the purpose of the study, and therefore we will have to decide how to use these results and information in the future" (Owner of a food processing firm, member of ANDIBOL).

From the statements above what stands out as a practical contribution is that during the process of action-research the participants started to understand and see the formation and operation of the platforms as an innovation process including not only the development of procedures to organize research and technology transfer services within a R&D project scheme, but also a process of institutional change and learning, and innovation capacity building.

8.4 Practical implications for designing conceptual models of institutional innovation and R&D projects

Considering the answers to the first and second questions of this research and the contributions discussed above, this section discusses the theoretical and practical

implications for the design of conceptual model and R&D projects, when they are used to drive institutional innovation processes aimed at fostering pro-poor agricultural innovation.

The Papa Andina Model and the Continuous Innovation Model demonstrate that the innovation systems approach is not only useful as a conceptual basis for studying innovation processes, but also to inform the development of models or approaches to fostering innovation at a local level. In this regard, this research shows that despite differences between the Papa Andina and the Continuous Innovations models of multi-stakeholder platforms, both implicitly include several of the conceptual insights offered by the innovations systems approach.

For example, by proposing multi-stakeholder platforms as spaces of interaction among different relevant actors for innovation, both models implicitly refer to the relational and interactional nature of innovation processes. In the same vein, the holistic and interdisciplinary nature of innovation is captured in both models by considering that innovation, whether technological, commercial or otherwise, requires and results from the articulation of multiple needs coming from actors with different social and economic backgrounds, different interests, and traditions of thinking and working, such as farmers, other market chain actors, R&D organizations, NGOs, and other service providers.

Finally, both models adopted the institutional dimension of the innovation processes highlighted in the innovation systems approach by proposing multi-stakeholder platforms as a multi-organizational form of collaboration in which different stakeholders define the rules governing their relationships and interactions. For example, the Papa Andina Model suggests that operational rules within the platform should be those reducing market chain actors' transaction costs in their commercial exchanges and those reducing the transaction costs that farmers and firms confront in accessing research and technology transfer services. For its part the Continuous Innovation model proposes that, within a local platform, operational rules should reduce the transaction costs that farmers confront in

accessing research and technology transfer services, and those that providers face in adjusting and offering their services in response to farmers' demands.

The examples above suggest that the current debate regarding the need for effective ways to foster agricultural innovation in developing countries could learn from the development, application and evaluation of approaches that put into practice the essential conceptual elements provided by the innovation systems approach. However, it is argued that when conceptual models are sought to foster collective processes of institutional innovation and R&D projects are used to drive these processes in practice, as was the case of the formation and operation of the multi-stakeholder platforms considered in this research, it is crucial that models provide guidelines regarding how they should be implemented, under what conditions, as well as defining the kind of outputs and outcomes that are expected from their application. These guidelines and definitions should be sufficiently flexible to allow adaptation to different contexts, but at the same time should ensure that the critical components describing the nature of the process of institutional innovation be present in the process of designing and implementing the R&D projects.

In this regard the conclusions in Chapter 7 indicate that although the Papa Andina Model and the Continuous Innovation Model provide well-grounded conceptual insights that implicitly incorporate several of the essential elements of the innovation systems approach, both lack guidelines indicating what critical components should necessarily be present in the project design. This lack of clarity gave rise to the functions of the platforms and the roles and positions of the participating actors being changed according to the tradition of equating agricultural innovation with the provision of services to respond farmers' needs and of separating projects' internal and external actors with which R&D projects are traditionally designed and implemented.

The discussion so far relates to the importance of defining clearly and explicitly the essential conceptual components of the models in order to avoid departures in the process

of designing R&D projects that imply changes in the nature of the innovation process that is sought to be fostered. Additionally, the findings of this research serve to propose three main aspects that should be borne in mind at the moment of designing and implementing R&D projects, when the purpose is to foster collective action processes of institutional innovation:

i) Special attention should be paid in clearly defining the objectives and outcomes of the process of institutional innovation and in separating them from others included in the projects' agenda. In the same vein, institutional innovation outcomes and indicators of achievement should be different than those traditionally used in R&D projects; they might at least reflect changes in the patterns of interaction, information exchange, and learning between actors, as well as reflecting the development of a shared vision, common objectives, practices and procedures.

ii) All participating actors should be considered as internal to the process, the assignment of roles and positions should arise from the interaction between actors and in correspondence with common objectives, and how each actor performs its role in a given position should be regulated by internally defined procedures.

iii) R&D projects should be designed and implemented as an action-research process in which the main activities, the manner in which they are developed, and the type of outputs that are expected to be achieved, are progressively defined and adjusted in accordance with the different visions, interests and traditions of working and thinking of the stakeholders participating in the process of institutional innovation. In this sense, a training and capacity building component as well as the use of participatory approaches of planning, monitoring and evaluation should be envisaged in the project design.

The findings of this research indicate that the inclusion of these aspects in the design and implementation of the InnovAndes Project and the Continuous Innovation Programme could avoid, at least partially, divergences, tensions and conflicts between participating actors in relation to whether they considered the process of formation and operation of the platforms in opposition to or in line with their vision and expectations.

The discussion so far poses a set of challenges for the design of R&D projects and therefore for designers, implementers and donors. These challenges are discussed in the next section along with the need of further studies to expand knowledge about the factors undermining or underpinning the willingness and capabilities of R&D organizations, NGOs, donors and other development and research agencies to face them.

8.5 Need for further research

The discussion above suggests that an R&D project-driven process of institutional innovation requires a flexible design that allows progressive adjustments as participants' capacities develop and in accordance with a participatory ongoing process of planning, monitoring and evaluation. It is argued that flexible design challenges the traditional way of monitoring and evaluating R&D projects: a shift from an approach focused on the achievement of results of the provision of research, technology transfer and other services, to an approach which focuses on monitoring and evaluating the progress of ongoing processes of innovation, and that allows adjustments as the processes evolve and as the participating individuals learn.

It is also argued that the discussion above challenges the traditional way of managing R&D projects, which are normally designed, managed and implemented by R&D organizations and NGOs. The challenge consists in a shift from the traditional roles of managing and implementing projects to a new role of facilitating collective processes of innovation in which the decisions affecting the progress of the processes are ultimately made by the participants (not by a traditional project steering committee). When R&D organizations

and NGOs are also the designers of the projects, all the considerations discussed above apply, but when the design is developed by other organizations, for example an international development agency or an international research organization, the selection of the organization that will play the role of facilitation is a crucial matter.

In this sense the project design should consider general guidelines about how the facilitating role should be performed. According to the experience, capacities and tradition of thinking and working of the selected facilitator, training and capacity building activities should be also envisaged including for example: training activities that enable the facilitator to grasp the critical conceptual bases of the innovation process that they are facilitating, training in the use of participatory approaches of planning and monitoring processes, training in techniques of facilitation and in conducting action-research processes, as well as including the exchange with other experiences in different contexts.

Finally, it is argued that the tradition of designing and managing agricultural R&D projects as mechanisms of provision of research, technology transfer, and other services in favour of farmers goes hand in hand with donors' traditions of investing and intervening in development through R&D projects. Therefore, the implications for the design of R&D projects discussed so far also challenges the way in which these projects are financially supported by donors.

On the basis of these challenges, four areas of further research are proposed regarding the factors undermining or underpinning the extent to which:

i) R&D organizations, NGOs, donors and other development and research agencies are willing and capable to rethink and adjust their organizational traditions of design, funding and implementing R&D projects in accordance with the challenges of supporting institutional innovation processes with a flexible definition of objectives and outcomes that could change over time as the processes evolved.

ii) R&D organizations, NGOs, donors and other development and research agencies are willing and capable to rethink and adjust their traditional systems of project monitoring and evaluation to make them suitable enough for monitoring and evaluating institutional innovation processes: changes in the patterns of interaction, information exchange, and learning between actors, as well as the development of a shared vision, common objectives, practices and procedures.

iii) R&D organizations and NGOs are willing and capable to act not as managers and implementers of R&D projects (at least not only) but as facilitators of processes of institutional innovation, and whether donors are willing to pay them in this new role.

iv) In correspondence with the three areas listed above, further research is needed on the types of change in organizational values, rules and ways of thinking and working, as well as on the type of new skills that organizations require to drive institutional innovation processes aimed at fostering pro-poor agricultural innovation, investing resources and intervening through R&D projects.

8.6 Relevance for the current efforts of strengthening the Bolivian system of agricultural innovation.

As discussed in Chapter 4, the Bolivian government, through the National Institute for Innovation in Agriculture and Forestry (INIAF) and with the financial support of the World Bank, is currently (in 2013) implementing a R&D project aimed at strengthening the Bolivian system of agricultural, livestock and forestry innovation. The project has among its goals to help the INIAF in leading the formation and operation of departmental and local networks for pro-poor innovation across the country, as well as to strengthen INIAF´s capabilities in agricultural research, technology transfer, seed certification and distribution. Similar to the two cases included in this research, this Bolivian R&D project-driven effort can be understood as a process that seeks the development of new forms of

multi-organizational collaboration conducive to agricultural innovation which implicitly encompasses a process of institutional innovation in terms of the development and enforcement of operational rules that enable networks' members to act collectively.

Because the implementation of this project began in late 2011 and runs until 2015, it is argued that its design and operation can be reviewed and adjusted if needed in the light of the findings of this research, particularly in relation to the project's objective of fostering the institutional innovation process of formation and operation of departmental and local networks for pro-poor innovation, known as Departmental and Local Committees for Agricultural and Livestock Innovation. The following are some questions that could guide a review of the project:

- Are the critical conceptual elements describing the nature and the rationale of the networks' existence clearly specified in the project design?
- Are the objectives and outcomes of the process clearly defined and distinguished from other project's objectives and outcomes (strengthening INIAF's capabilities in agricultural research, technology transfer, seed certification and distribution, for instance)?
- Do the outcomes, indicators of achievement and project's monitoring and evaluation instruments correspond to the procedural and systemic nature of the innovation process of formation and operation of the networks?
- Do the project's definitions regarding the role and position of the different players lead to tensions and conflicts undermining the process?
- Is the INIAF facing ambiguity of functions and legitimacy problems in playing simultaneously the role of facilitation of the process and the role of research, technology transfer, seed certification and distribution leading organization?

Finally, it is argued that the conceptual framework and the methodological approach of this research, and the questions listed above could be the basis for designing and undertaking an in-depth action-oriented study to inform the ongoing process of strengthening the Bolivian system of agricultural innovation and to gain knowledge on the four areas identified for further research.

References

Abbott, D. (1998) "Dilemmas of researching poverty", in Thomas, A., Chataway, J. and Wuyts, M. (eds) *Finding out fast: investigative skills for policy and development*, Minton Keynes, UK, The Open University, SAGE, pp. 201-220.

Agarwal, B. (2010) "Rethinking agricultural production collectivities", *Economic & Political WEEKLY*, vol. XLV, no. 9, pp. 64 – 78.

Agrawal, A. (2001) "Common property institutions and sustainable governance of resources", *World Development*, vol. 29, no. 10, pp. 1649 – 1672.

Anderson, G. and Arsenault, N. (1998) *Fundamentals of Educational Research*, 2nd edn, London, Falmer Press.

Arocena, R. and Sutz, J. (2000) "Looking at national systems of innovation from the south", *Industry and Innovation*, vol. 7, no. 1, pp. 55 – 75.

Baland, J.M. and Platteau, J.P. (1999) "The ambiguous impact of inequality on local resource management", *World Development*, vol. 27, pp. 773 – 788.

Barham, J. and Chitemi, C. (2008) "Collective action initiatives to improve marketing performance", *CAPRi Working Paper*, no. 74, p.44.

Barnett, A. (2008) *A summary of the national systems of innovation approach* [online], Brighton, UK, The Policy Practice Limited. Available at http://www.thepolicypractice.com/papersdetails.asp?code=1

Berdegué, J. (2001) *Cooperating to Compete: Associative Peasant Business Firms in Chile*, PhD Thesis, Wageningen.

Bernet, T., Thiele, G. and Zschocke, T. (2006) *Participatory Market Chain Approach (PMCA): User Guide*, Lima, Peru, International Potato Center.

Blaxter, L., Hughes, C. and Tight, M. (2006) *How to research*, 3rd edn, New York, Open University Press, McGraw–Hill Education.

Bloor, M. Frankland, J. Thomas, M. and Robson, K. (2001) *Focus Groups in Social Research*, London, SAGE.

Bojanic, A. (2001) "Extension, poverty and vulnerability in Bolivia and Colombia: Country studies for the Neuchatel Initiative", *ODI Working Paper*, no. 153, p. 28.

Bolivia. Honorable Asamblea Plurinacional (2011) *Ley No. 144 Revolución Productiva Comunitaria Agropecuaria*. La Paz, Bolivia. (0144).

Bolivia. Honorable Asamblea Plurinacional (2010) *Ley No. 031 Marco de Autonomías y Descentralización "Andrés Ibañez"*. La Paz, Bolivia. (031).

Bolivia. Presidencia de la República (2000) *Decreto Supremo No.25717*. La Paz: (25717).

Bolivia. Honorable Congreso Nacional (1994) *Ley No. 1551 de participación Popular*. La Paz, Bolivia. (1551).

Bowling, A. (1997) *Research methods n health: investigating health and health services*, Milton Keynes, UK, Open University Press.

Braun, V. and Clarke, V. (2006) "Using thematic analysis in psychology", Qualitative Research in Psychology, vol. 3, pp. 77 – 101.

Cash, D., W. Clark, F. Alcock, N. Dickson, N. Eckley, D. Guston, J. Jager, and R. Mitchell. (2003) "Knowledge systems for sustainable development", *PNAS*, vol. 100, no. 14, pp. 8086 – 8091.

CDC-PIC. (2010) *Modelo operativo del Programa de Innovación Continua – Cochabamba*, Consejo Departamental de Competitividad, Programa de Innovación Continua.

CDC-PIC. (2009) *Reglamento interno del Comité Directivo del Programa de Innovación Continua – Cochabamba*, Cochabamba, Consejo Departamental de Competitividad, Programa de Innovación Continua.

Century, J. Rudnick, M. and Freeman, C. (2010) "A framework for measuring fidelity of implementation: a foundation for shared language and accumulation of knowledge", *American Journal of Evaluation*, vol. 32, no. 2, pp. 199 – 218.

Chambers, R. (2007) "Who counts? The quiet revolution of participation and numbers", *Institute of Development Studies (IDS) Working Paper*, no. 296, p. 43.

Chataway, J. and Joffe, A. (1998) "Communicating results", in Thomas, A., Chataway, J. and Wuyts, M. (eds) *Finding out fast: investigative skills for policy and development*, Minton Keynes, UK, The Open University, SAGE, pp. 221-236.

CIP. (2010) *Síntesis de levantamiento y análisis preliminar de información referida a la soberanía y seguridad alimentaria en Bolivia, Ecuador y Perú,* Centro Internacional de la Papa, Documento de Trabajo.

Clark, L. (2006) *Manual para el mapeo de redes como una herramienta de diagnóstico*, La Paz, Bolivia, Ministerio de Desarrollo Rural, Agropecuario y Medio Ambiente.

Clark, N., Smith, J. and Hirvonen, M. (2007) "Livestock R&D in East and Southern Africa: an innovation systems perspective with special reference to the International Livestock Research Institute (ILRI)", *International Journal of Technology Management and Sustainable Development*, vol. 6, no. 1.

Clark, N., Hall, A., Sulaiman, R. and Naik, G. (2003) "Research as capacity building: the case of an NGO facilitated post-harvest innovation system for the Himalayan hills", *World Development*, vol. 31, no. 11, pp. 1845 – 1863.

Clark, N. (2002) "Innovation systems, institutional change and the new Knowledge market: implications for Third World agricultural development", *Economics of Innovation New Technology*, vol. 11, pp .353 – 368.

COSUDE. (2009) *Plan operativo fase de implementación 2009-2011, Programa de Innovación Continua PIC*, La Paz, Bolivia, COSUDE.

Critchley, W., Verbug, M. and van Veldhuizen, L. eds. (2006) *Facilitating multi-stakeholder partnerships: lessons from PROLINNOVA*, A publication in the series of Promoting Local Innovation, Silang, Cavite, Philippines, IIRR/Leusden, PROLINNOVA International Secretariat, ETC EcoCulture.

Cuellar, A. (2002) *Análisis y cartografía de la vulnerabilidad a la inseguridad alimentaria en Bolivia*, Bolivia, WFP, SINSAAT, MDSP.

Devaux, A., Andrade-Piedra, J., Horton, D., Ordinola, M., Thiele, G., Thomann, A. and Velasco, C. (2010) "Brokering innovation for sustainable development: the Papa Andina case", *ILAC Working Paper*, no. 12, p. 32.

Devaux, A., Horton, D., Velasco, C., Thiele, G., López, G., Bernet, T., Reinoso, I., Ordinola, M. and Pico, H. (2009) "Collective action for market chain innovation in the Andes", *Food Policy*, vol. 34, pp. 31 – 38.

Dorward, A., Kidd, J., Poulton, C. and Bezemer, D. (2009) "Coordination risk and impacts on economic development in poor rural areas", *Journal of Development Studies*, vol. 45, no. 1, pp. 1-20.

Dorward, A., Kydd, J., Morrison, J. and Poulton, C. (2005) "Institutions, markets and economic co-ordination: Linking development policy to theory and praxis". *Development and Change,* vol. 36, no. 1, pp. 1–25.

Dorward, A., Poole, N., Morrison, J., Kydd, J. and Urey, I. (2002) "Critical linkages: livelihoods, markets and institutions", *Bradford Centre for International Development. Seminar on Supporting Institutions, Evolving Livelihoods*. Bradford, UK, 2002. pp. 1-12.

Edquist, C. (2010) "The Swedish paradox – unexploited opportunities!", *Circle, Lund University*, paper no. 2010/05, p. 27.

Edquist, C. (2001) "Innovation Policy – A Systemic Approach", in Archibugi and Lundvall, B. A. (eds.) *The Globalizing learning economy*, Oxford University Press.

Edquist, C. (1997). "Systems of innovation approaches: their emergence and characteristics", in Edquist, C. (ed.) *Systems of innovation - Technologies, institutions and organizations*. London, UK , Pinter publishers/Cassel Academic.

Engel, P. G. H., and Salomon, M. L. (1997) *Facilitating innovation for development: A RAAKS resource box*. Amsterdam, Royal Tropical Institute.

FAO. (2012a) FAOSTAT 2012 [Online]. Available at http://faostat.fao.org/site/666/default.aspx (Accessed January 2013).

FAO. (2012b) *El estado mundial de la agricultura y la alimentación: invertir en la agricultura para construir un futuro mejor*, Roma, FAO.

Fereday, J. and Muir-Cochrane, E. (2006) "Demonstrating rigor using thematic analysis: a hybrid approach of inductive and deductive coding and theme development", *International Journal of Qualitative Methods*, vol.5, no. 1, pp. 80 – 92.

Gandarillas, E. (2006) *Agricultural Innovation Systems to the Needs of the Poor: An Investigation of Participatory Monitoring and Evaluation in Bolivia.* PhD Thesis, Wye, Imperial College, University of London.

Gibbons, M., Limoges, C., Nowontny, H., Schwartzman, S., Scott, P. and Trow, M. (1994) *The New Productions of Knowledge*, London Sage.

Godoy, R., de Franco, M. and Echeverria, R.G. (1003) "A brief history of agricultural research in Bolivia: potatoes, maize, soybeans, and wheat compared", *Harvard Institute for International Development, Development Discussion Papers*, no. 460, p. 21.

Grootaert, C. and van Bastelaer, T. (2002) "Understanding and measuring social capital: a synthesis of findings and recommendations from the Social Capital Initiative", *IRIS Center Forum Series on the Role of Institutions in Promoting Economic Growth*, FORUM 1 The Institutional Approach to Donor-Facilitated Economic Development, Session on Social Capital. Washington, D.C. 11 January, 2002, p. 39.

Gruere, G.P., Nagarajan, L. And King Oliver, E.D.I. (2007) "Collective action and marketing of underutilized plant species: the case of minor millets in Kolli Hills, Tamil Nadu, India", *CAPRi Working Paper*, no. 69, p. 34.

Hall, A., Sulaiman, R. and Bezkorowajnyj, P. (2008) "Reframing technical change: livestock fodder scarcity revisited as innovation capacity scarcity. Part 2: a framework for analysis", *UNU –MERIT Working Paper Series*, no. 2008-003, p. 25.

Hall, A. (2007) "Challenges to strengthening agricultural innovation systems: where do we go from here?", *UNU –MERIT Working Paper Series*, no. 2007 - 38, p. 25.

Hall, A., Clark, N. And Naik, G. (2007) "Institutional change and innovation capacity: contrasting experiences of promoting small-scale irrigation technology in South Asia", *International Journal of Technology Management and Sustainable Development*, vol. 6, no. 2, pp. 77 – 101.

Hall, A., Mytelka, L. and Oyeyinka, B. (2006) "Concepts and guidelines for diagnostic assessment of agricultural innovation capacity", *UNU –MERIT Working Paper Series*, no. 2006-017, p. 33.

Hall, A. (2005) "Capacity development for agricultural biotechnology in developing countries: an innovation systems view of what it is and how to develop it", *Journal of International Development*, vol. 17, pp. 611 – 630.

Hall, A., Sulaiman, R., Clark, N. and Yoganand, B. (2003) "From measuring impact to learning institutional lessons: an innovation systems perspective on improving the management of international agricultural research", *Agricultural Systems*, vol. 78, pp. 213 – 241.

Hall, A., Bockett, G., Taylor, S., Sivamohan, M. and Clark, N. (2001a) "Why research partnerships really matter: innovation theory, institutional arrangements and implications for developing new technology for the poor", *World Development*, vol. 29, no. 5, pp. 783-797.

Hall, A., Clark, N., Taylor, S. and Sulaiman, R. (2001b) "Institutional learning through technical projects: horticulture technology R&D systems in India" *AgREN Network Paper*, no 111, p. 11.

Hartwich, F., Alexaki, A., and Babtista, R. (2007a) "Innovation systems governance in Bolivia: lessons for agricultural innovation policies" *IFPRI Division Discussion Papers*, no. 00732, p. 68.

Hartwich, F., Gottret, V., Babu, S., & Tola, J. (2007b) "Building public-private partnerships for agricultural innovation in Latin America", *IFPRI Discussion Paper*, no. 00699.

Hartwich, F., Gonzales, C. and Viera, L.F. (2005) "Public-private partnerships for innovation-led growth in agrichains: a useful tool for development in Latin America?", *IFPRI Division Discussion Papers*, no. 1, p. 34.

Hellin, J., Lundy, M. and Meijer, M. (2007) "Farmer organization, collective action and market access in Meso-America", *CAPRi Working Paper*, no. 67, p. 28.

Horton, D., Rotondo, E., Paz Ybarnegaray, R., Hareau, G., Devaux, A. and Thiele, G. (2013) "Lapses, infidelities, and creative adaptations: lessons from evaluation of a participatory market development approach in the Andes", *Evaluation and Program Planning*, vol. 39, pp. 28 – 41.

Horton, D., Prain, G. and Thiele, G. (2009) "Perspective on partnership: a literature review", International Potato Center (CIP) Working Paper, no. 3, p.111.

IFAD. (2011) *Informe sobre la pobreza rural 2011*, Fondo Internacional de Desarrollo Agrícola (FIDA), Roma, Quintily.

INE. (2013) Instituto Nacional de Estadísticas [Online]. Available at http://www.ine.gob.bo/default.aspx (Accessed between September 2012 and March 2013).

INE. (2008) *Encuesta Nacional de demografía y salud ENDSA 2008*, Bolivia, Instituto Nacional de Estadísticas, Ministerio de Salud y Deportes.

INIAF. (2010a) *Plan estratégico institucional 2011-2015*, Bolivia, Ministerio de Desarrollo Rural y Tierras, Instituto Nacional de Innovación Agropecuaria y Forestal.

INIAF. (2010b) *Proyecto de innovación y servicios agropecuarios y forestales PISA*, Bolivia, Ministerio de Desarrollo Rural y Tierras, Instituto Nacional de Innovación Agropecuaria y Forestal.

Internacional Potato Center, (2006) *Proyecto fortalecimiento de las capacidades para innovar y reducir la pobreza en los Andes*, Lima, Perú, Centro Internacional de la Papa.

JICA. (2007) *Directorio de ONGs que trabajan en Bolivia*, La Paz, Bolivia, JICA.

Johnson, B., Edquist, C. and Lundvall, B.A. (2003) "Economic Development and the National System of Innovation Approach", *Paper presented at 1st Glogelics Conference*, Rio de Janeiro, November 3 -6 2003, p. 24.

Johnson, N. and Berdegué, J.A. (2004) "Property rights, collective action, and agribusiness", in Meinzen-Dick, R. and Di Gregorio, M. (eds.) *Collective action and property rights for sustainable development.* IFPRI. FOCUS II, brief 13 of 16.

Klerkx, L. and Leeuwis, C. (2009) "Establishment and embedding of innovation brokers at different innovation system levels: insights from the Dutch agricultural sector", *Technological Forecasting & Social Change*, vol. 76, pp. 849 – 860.

Klerkx, L. Hall, A. and Leeuwis, C. (2009a) "Strengthening agricultural innovation capacity: are innovation brokers the answer?", *UNU-MERIT Working Paper,* no. 2009-0.19, p. 47.

Klerkx, L. Hall, A. and Leeuwis, C. (2009b) "Strengthening agricultural innovation capacity: are innovation brokers the answer?", *Agricultural Resources, Governance and Ecology,* vol. 8, nos. 5/6, pp. 409 - 438.

Klerkx, L. And Leeuwis, C. (2008) "Balancing multiple interests: embedding innovation intermediation in the agricultural knowledge infrastructure", *Technovation,* vol. 28, pp. 364 – 378.

Krishna, A. and Uphoff, N. (2002) "Mapping and Measuring Social Capital through Assessment of Collective Action to Conserve and Develop Watersheds". In Rajasthan, India. In: Grootaert, C. and van Bastelaer, T. (eds.) *The Role of Social Capital in Development: An Empirical Assessment.* Cambridge, Cambridge University Press.

Krishna, A. (2000) "Creating and Harnessing Social Capital". In Dasgupta, P. and Serageldin, I. (eds.), *Social Capital: A Multifaceted Perspective.* Washington, DC, The World Bank.

Kristjanson, P., Reid,R., Dickson, N., Clark, W., Vishnubhotla, P., Romney, D., Bezkorowajnyj, P., Said, M., Dickson, K., Makui, O., Nkedianye, D., Nyangaga, J., Okwi, P., Puskur, R., Tarawali, S., MacMillan, S., Grace, D.,Randolph, T. and Affognon, H. (2008) "Linking international agricultural research knowledge with action for sustainable poverty alleviation: what works?", *Center for International Development at Harvard University Working Papers*, no. 173, p. 52

Kruijssen, F., Deizer, M. and Giuliani, A. (2007) "Collective action for small-scale producers of agricultural biodiversity products", *CAPRi Working Paper*, no. 71, p. 28.

Lema, R., Meneses, O., Crespo, A. and Muñoz-Reyes, R. (2006) *Evaluación de efectos e impactos del SIBTA. Informe final*, Bolivia, Ministerio de Desarrollo Rural, Agropecuario y Medio Ambiente.

Lundvall, B. A., Johnson, B., Andersen, E. and Dalum, E. (2002) "National systems of production, innovation and competence building", *Research Policy*, vol. 31, no. 2, pp. 213 – 231.

Markelova, H., Meinzen-Dick, R., Hellin, J. and Dohrn, S. (2009) "Collective action for smallholder market access", *Food Policy*, vol. 34, pp. 1 – 7.

Matuschke, I. (2008) "Evaluating the impact of social networks in rural innovation systems: an overview", *IFPRI Discussion Paper*, no. 00816, p. 26.

Mayer, S. (1998) "Critical issues in using data", in Thomas, A., Chataway, J. and Wuyts, M. (eds) *Finding out fast: investigative skills for policy and development*, Minton Keynes, UK, The Open University, SAGE, pp. 289-306.

McNie, E.C., van Noordwijk, M., Clark, W.S., Dickson, N.M., Sakuntaladewi, N., Suyando., Joshi, K., Leimona, B., Hairiah, K. and Khususiyah, N. (2008) " Boundary organizations, objects and agents: linking knowledge to action in agroforestry watersheds" *Report of a Workshop*. Malang, East Java, Indonesia, 26 – 29 July, 2007. Center for International Development at Harvard University. p. 41.

McNie, E. (2007) "Reconciling the supply of scientific information with user demands: an analysis of the problem and review of the literature", *Environmental Science and Policy*, vol. 10, pp. 17 – 38.

Meinzen-Dick, R., Devaux, A. and Antezana, I. (2009) "Underground assets: potato biodiversity to improve the livelihoods of the poor", *International Journal of Agricultural Sustainability*, vol. 7, no. 4, pp. 235-248.

Meinzen-Dick, R. and Di Gregorio, M. (2004) "Overview". In Meinzen-Dick, R. and Di Gregorio, M. (eds.) *Collective action and property rights for sustainable development.* IFPRI. FOCUS II, brief 1 of 16.

Meinzen-Dick, R., Di Gregorio, M. and McCarthy, N. (2004) "Methods for studying collective action in rural development", *Agricultural Systems*, vol. 82, pp. 197 – 214.

Ministerio de Planificación y Desarrollo del Estado Plurinacional de Bolivia. (2006) *Plan Nacional de Desarrollo: Bolivia digna, soberana, productiva y democrática para vivir bien*, Bolivia, Ministerio de Planificación y Desarrollo del Estado Plurinacional de Bolivia.

Montaño, G., Muñoz, D., Zapata, V. and Pedregal, M.A. (2007) *Innovación tecnológica para los pequeños productores: lecciones aprendidas del Programa FIT (Facilitando la Innovación Tecnológica),* Bolivia, DIFID-Alianza Cambio Andino, PLURAL Ediciones.

Morse, J.M., Barrett, M., Mayan, M., Alson, K. and Spiers, J. (2002) "Verification strategies for establishing reliability and validity in qualitative research", *International Journal of Qualitative Methods*, vol. 1, no. 2, pp. 13 – 22.

Nelson, R. and Nelson, K. (2002) "Technology, institutions, and innovation systems", *Research Policy*, vol. 31, pp. 265 – 272.

North, D. (1996) *Institutions, institutional change and economic performance*. Cambridge University Press.

Ostrom, E. (2010) "The Institutional Analysis and Development Framework and the commons", *Cornell Law Review*, vol. 95, pp. 807 – 816.

Ostrom, E. (2005) *Understanding institutional diversity*, Princeton University Press.

Ostrom, E. (2004) "Understanding collective action". In Meinzen-Dick, R. and Di Gregorio, M. (eds.) *Collective action and property rights for sustainable development*. IFPRI. FOCUS II, brief 2 of 16.

Oyelaran-Oyeyinka, B. (2005) "Systems of innovation and underdevelopment: an institutional perspective", *UNU –MERIT Working Paper Series*, no. 2005 - 1, p. 36.

Paniagua, R., Catacora, G. and Azero, A. (2010) *Informe de actividades trimestre 1, 2010: sistematización de actividades y experiencias del período 4 de enero al 31 de marzo del 2010*, Cochabamba, CDC-COSUDE-PIC.

Piñeiro, M. (2009) "Construyendo una nueva institucionalidad agropecuaria: algunos temas no resueltos", in FAO. *La institucionalidad agropecuaria en América Latina: estado actual y nuevos desafíos*, Santiago, Chile, FAO, pp. 521-544.

Plataforma Andina Boliviana. (2007) *Plan estratégico 2007 – 2010*, La Paz, Bolivia, Construyendo Empresas.

Polsky, M. and Ostrom, E. (1999) "An institutional framework for policy analysis and design", *Indiana University, Workshop in Political Theory and Policy Analysis*, no. W98-27, p. 49.

Poteete, A.R. and Ostrom, E. (2004) "In pursuit of comparable concepts and data about collective action", *Agricultural Systems*, vol. 82, pp. 215 - 232.

Rajalahti, R., Janssen, W. and Pehu, E. (2008) "Agricultural innovation systems: from diagnosis toward operational practices", The World Bank, Agricultural and Rural Development Discussion Paper, no. 38, p. 87.

Rasmussen, L. N. and Meinzen-Dick, R. (1995) "Local organizations for natural resource management: lessons from theoretical and empirical literature", *IFPRI-EPTD Discussion Paper*, no. 11, p. 35.

Robson, C. (1993) *Real world research: a resource for social scientists and practitioner researchers*, Oxford, Blackwell.

Ruttan, L. (2008) "Economic heterogeneity and the commons: effects on collective action and collective goods provisioning", *World Development*, vol. 36, no. 5, pp. 969 – 985.

Sanjines, E. (2006) *Plan Nacional de Desarrollo: Bolivia digna, soberana, productiva y democrática para vivir bien*, Fundación Tierra, p. 16.

SIBTA. (2003) *Sistema Boliviano de Tecnología Agropecuaria*, La Paz, Bolivia, Ministerio de Asuntos Campesinos y Agropecuarios.

Smits, R. (2002) "Innovation studies in the 21st century: questions from a user's perspective", *Technological Forecasting & Social Change*, vol. 69, pp. 861 – 883.

Spielman, D.J. (2005) "Innovation system perspective on developing – country agriculture: a critical review. *IFPRI Division Discussion Papers*, no. 2, p. 58.

Sultana, P. and Thompson, P. (2004) "Methods of consensus building for community-based fisheries management in Bangladesh and the Mekong Delta", *Agricultural Systems*, vol. 82, pp. 327 - 353.

Thiele, G., Devaux, A., Reinoso, I., Pico, H., Montesdeoca, F., Pumisacho, M., Andrade-Piedra, J., Velasco, C., Flores, P., Esprella, R., Thomann, A., Manrique, K. and Horton, D. (2011) "Multi-stakeholder platforms for linking small farmers to value chains: evidence from the Andes", *International Journal of Agricultural Sustainability*, vol. 9, no. 3, pp. 1-11.

Thomas, A. (1998) "Challenging Cases", in Thomas, A., Chataway, J. and Wuyts, M. (eds) *Finding out fast: investigative skills for policy and development*, Minton Keynes, UK, The Open University, SAGE, pp. 307-332.

Tobin, G.A. and Begley, C.M. (2004) "Methodological rigour within a qualitative framework", *Journal of Advanced Nursing*, vol. 48, no. 4, pp. 388 – 396.

Van Kerkhoff, L. and Lebel, L. (2006) "Linking knowledge and action for sustainable development", Annu. Rev. Environ. Resour., vol, 31, pp. 445-477.

van Kerkhoff, L. (2005) "Integrated research: concepts of connection in environmental science and policy", Environmental Science and Policy, vol. 8, pp. 453-463.

Watkins, A. and Ehst, M. (2008) *Science, technology, and innovation: capacity building for sustainable growth and poverty reduction.* Washington, D.C., The World Bank.

Winter, R. and Munn-Giddings, C. (2001) *A handbook for action research in health and social care*, London, Routledge.

Woodhouse, P. (1998) "People as Informants", in Thomas, A., Chataway, J. and Wuyts, M. (eds) *Finding out fast: investigative skills for policy and development*, Minton Keynes, UK, The Open University, SAGE, pp. 127-146.

World Bank. (2011) *Documento de evaluación de proyecto sobre una propuesta de crédito por un monto de DEG 24.4 millones (Equivalentes de USD 39 millones) al Estado Plurinacional de Bolivia, para el Proyecto de Innovación y Servicios Agropecuarios*, Banco Mundial, 57824-BO.

World Bank. (2007) *Enhancing agricultural innovation: how to go beyond the strengthening of research systems,* Washington, D.C., The World Bank.

Yin, K.R. (1994) *Case Study Research: Design and Methods*, 2nd edn, London, New Delhi. SAGE.

Appendix 1 Exploratory step data collection instrument: electronic questionnaire protocol

ANDIBOL case

Respondent′ name:

Date:

Part 1: Open-ended questions

Q1. What are the objectives and functions of ANDIBOL?

Q2. Why do you participate in ANDIBOL, what are your interests and expectations?

Q3. What are your roles within ANDIBOL and the roles of the other members?

Part 2: Questions with pre-coded response choices:

Q4. Whose interests did the objective and functions of the platform as stated in ANDIBOL′s strategic plan correspond to?

All the members	
Farmers only	
Supporting organizations only	
Firms only	
Farmers and supporting organizations only	
Farmers and firms only	
Firms and supporting organizations only	

Do you have any comment about your answers?:

List of respondents

- Representative of the R&D organization implementing InnoAndes and facilitating ANDIBOL
- Representative of the NGO implementing InnovAndes
- Owner of Firm 1
- Owner of Firm 2
- Owner of Firm 3
- Owner of the company specializing in foreign trade logistic
- Representative of the international foundation

Appendix 2 Exploratory step data collection instrument: face-to-face interview protocol

CD-PIC case

Respondent′ name:

Date:

Q1. What are the objectives and functions of CD-PIC?

Q2. Why do you participate in the CD-PIC, what are your interests and expectations?

Q3. What are your roles within the CD-PIC and the roles of the other members?

According to its internal regulations the CD-PIC has two types of functions: those related to the implementation of the programme, and those related to the strategic orientation of agricultural innovation in Cochabamba.

Q4. Are these functions complementary, antagonistic or independent?

Q5. Did the CD-PIC achieve same level of progress in performing both functions?

ANDIBOL case

Respondent′ name:

Date:

Q1. In the electronic questionnaire you said that..... about the objectives and functions of ANDIBOL; can you elaborate on .....?

Q2. In the electronic questionnaire you said that..... about your interests and expectations; can you elaborate on .....?

Q3. In the electronic questionnaire you said that..... about your roles and the roles of the others; can you elaborate on .....?

Q4. These are the answers provided by all to the questions: whose interests did the objective and functions of the platform as stated in ANDIBOL′s strategic plan correspond to? What is your opinion in this regard?

List of respondents

CD-PIC case

Representative of:

- Private R&D organization 1
- Private R&D organization 2
- Public University
- Private University 1
- Private University 2
- Departmental Government
- Chamber of Private Entrepreneurs
- Small and Medium Private Firms Federation

ANDIBOL case

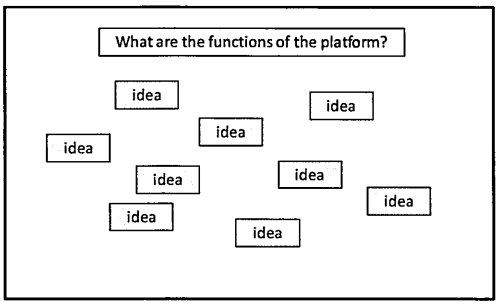
- Representative of the R&D organization implementing InnoAndes and facilitating ANDIBOL
- Representative of the NGO implementing InnovAndes
- Owner of Firm 1
- Owner of Firm 2
- Owner of Firm 3
- Owner of the company specializing in foreign trade logistic
- Representative of the international foundation

Appendix 3 Exploratory step data collection instrument: focus group protocol, Native Potatoes Local Platform and Peach Local Platform

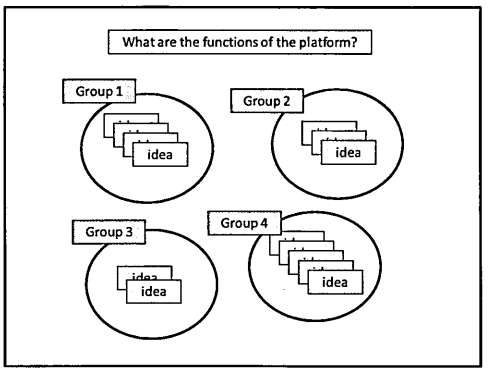
Session 1: Welcome, explanation of objectives and procedures, gathering participants' expectations.

Session 2: brainstorm

- Guiding questions: What are the functions of the platform?, What are you doing in the Platform?
- Gathering ideas: The facilitator writes ideas from the participants in cards. The facilitator stimulates all the participants to offer their ideas. Cards are posted in a wall.

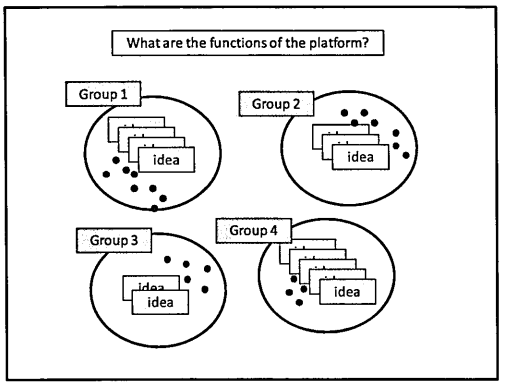


- Grouping ideas: The facilitator helps the participants to group common ideas



Session 3: Voting exercise

- Using stickers participant votes for the groups they considered the most important
- Possible number of votes per participant = number of groups
- Participants can vote for one alternative more than once



Session 4: Open discussion

- After voting the participants are asked to comment on the results
- The facilitator stimulates all the participants to offer their comments
- The facilitator takes notes. All comments are recorded

List of participants

Native Potatoes Local Platform

The focus group session was held with three representatives of farmers, one of the local government and two of R&D organizations.

Peach Local Platform

The focus group session was held with three representatives of farmers, three of the local governments, and two of R&D organizations.

Appendix 4 Exploratory step data collection instrument: focus group protocol, farmers participating in ANDIBOL

- Guiding questions:
  - What are the functions of the platform?
  - What are you doing in the Platform? What are your roles within the platform?
  - What are the roles of other members?
  - Why do you participate in the platform, what are your interests and expectations?
  - How do you participate in the platform? Do you participate in decision making?
  - Do you have relationships with all the other members? How these relationships are?
  - Does the platform benefit you?
- The facilitator stimulates all the participants to offer their comments
- The facilitator takes notes. All comments are recorded

List of participants

The focus group was held with eight farmers' leaders from the farmers' organization participating in ANDIBOL (5 men and 3 women).

Appendix 5 Deepening step data collection instrument: electronic questionnaire protocol, ANDIBOL case

Respondent' name:

Date:

Part 1: Structure of relationships of coordination and information exchange within ANDIBOL

Q1. Can you identify the other ANDIBOL members with whom you hold relationships of coordination and information exchange?

Relationships of coordination

With whom		Are these relationships		
		Strong?	Weak?	Any comment
Firm 1				
Firm 2				
Firm 3				
Farmers				
R&D organization				
International foundation				
NGO				
Company specializing in foreign trade logistic				

Information exchange

With whom		Are these relationships		
		Permanent?	Sporadic?	Any comment
Firm 1				
Firm 2				
Firm 3				
Farmers				
R&D organization				
International foundation				
NGO				
Company specializing in foreign trade logistic				

Part 2: ANDIBOL members' participation

Q2. How do you assess the participation of others members in ANDIBOL?

	Very high	High	Medium	Low	Very low
Firm 1					
Firm 2					
Firm 3					
Farmers					
R&D organization					
International foundation					
NGO					
Company specializing in foreign trade logistic					

Part 3: Decision making process within ANDIBOL

Q2. The decisions taken in ANDIBOL represent mainly the interest of:

All the members	
Farmers only	
Supporting organizations only	
Firms only	
Farmers and supporting organizations only	
Farmers and firms only	
Firms and supporting organizations only	

List of respondents

- Representative of the R&D organization implementing InnoAndes and facilitating ANDIBOL
- Representative of the NGO implementing InnovAndes
- Owner of Firm 1
- Owner of Firm 2
- Owner of Firm 3
- Owner of the company specializing in foreign trade logistic
- Representative of the international foundation

Appendix 6 Deepening step data collection instrument: face-to-face interview protocol, ANDIBOL case

Respondent' name:

Date:

Guiding questions:

- Q1. These are the answers provided by all to the question in the electronic questionnaire regarding the structure of relationships of coordination and information exchange. Can you elaborate on……?
- Q2. These are the answers provided by all to the question in the electronic questionnaire regarding ANDIBOL members' participation. Can you elaborate on……?
- Q3. These are the answers provided by all to the question in the electronic questionnaire regarding ANDIBOL decision making process. Can you elaborate on……?

List of respondents

- Representative of the R&D organization implementing InnoAndes and facilitating ANDIBOL
- Representative of the NGO implementing InnovAndes
- Owner of Firm 1
- Owner of Firm 2
- Owner of Firm 3
- Owner of the company specializing in foreign trade logistic
- Representative of the international foundation

Appendix 7 Deepening step data collection instrument: electronic questionnaire protocol, CD-PIC case

Respondent′ name:

Date:

Part 1: CD-PIC fulfilment of functions

Regarding the CD-PIC′ competences of analyzing, adjusting and prioritizing research and technology transfer mandates:

Q1: To what extent the mandates correspond to or are the result of the articulation of members′ different visions and ideas about agricultural innovation priorities?

Very high	
High	
Medium	
Low	
Very low	

Q2: To what extent the mandates articulate local needs with departmental development priorities and policies?

Very high	
High	
Medium	
Low	
Very low	

Regarding the performance of the CD-PIC′s competences in relation to the bidding process for allocating projects:

Q3. How satisfied are you in relation to:

	Very high	**High**	**Medium**	**Low**	**Very low**
Evaluate and approve terms of reference to recruit specialized orga provision of research and technology transfer services.					
Evaluate, approve and allocate projects to the best bidders.					
Monitor and evaluate the implementation of projects and their results.					

Regarding the information and procedures used by the CD-PIC to make decision in relation to the bidding process for allocating projects:

Q4: Is the information used by the CD-PIC to make decisions:

Sufficient		Moderately sufficient		Insufficient	

Relevant		Moderately relevant		Not relevant	

The information flows through:

Suitable channels		Moderately suitable channels		Not suitable channels	

Q5: Are the procedures used by the CD-PIC to make decisions:

Clearly defined		Moderately clear		Unclear	

Easy to apply		Moderately easy to apply		Difficult to apply	

Part 2: CD-PIC's decision making process

Regarding the CD-PIC' competences of analyzing, adjusting and prioritizing research and technology transfer mandates:

Q6: Can you identify whether the Local Platforms, the CD-PIC and the Technical Secretariat are involved in each of the steps of the decision making process?

	Step 1: Providing and receiving information		Step 2: Analyzing information and suggesting decisions		Step 3: Taking final decisions	
Local Platforms	YES	NO	YES	NO	YES	NO
CD-PIC	YES	NO	YES	NO	YES	NO
Technical Secretariat	YES	NO	YES	NO	YES	NO

List of respondents

Representative of:

- Private R&D organization 1
- Private R&D organization 2
- Public University
- Private University 1
- Private University 2
- Departmental Government
- Chamber of Private Entrepreneurs
- Small and Medium Private Firms Federation

Appendix 8 Deepening step data collection instrument: face-to-face interview protocol, CD-PIC case

Respondent' name:

Date:

Guiding questions:

- Q1. These are the answers provided by all to the question in the electronic questionnaire regarding the extent to which the mandates correspond to or are the result of the articulation of members' different visions and ideas about agricultural innovation priorities. Can you elaborate on……?
- Q2. These are the answers provided by all to the question in the electronic questionnaire regarding the extent to which the mandates articulate local needs with departmental development priorities and policies. Can you elaborate on……?
- Q3. These are the answers provided by all to the question in the electronic questionnaire regarding the performance of the CD-PIC's competences in relation to the bidding process for allocating projects. Can you elaborate on……?
- Q4. These are the answers provided by all to the question in the electronic questionnaire regarding the information and procedures used by the CD-PIC to make decision in relation to the bidding process for allocating projects. Can you elaborate on……?

List of respondents

Representative of:

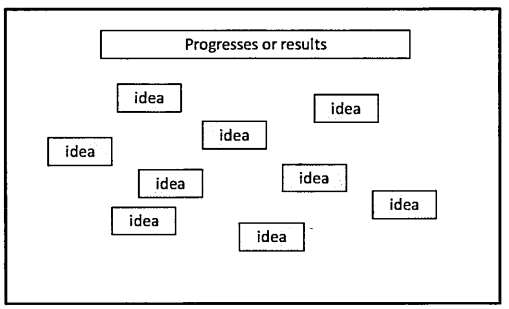
- Private R&D organization 1
- Private R&D organization 2
- Public University
- Private University 1
- Private University 2
- Departmental Government
- Chamber of Private Entrepreneurs
- Small and Medium Private Firms Federation

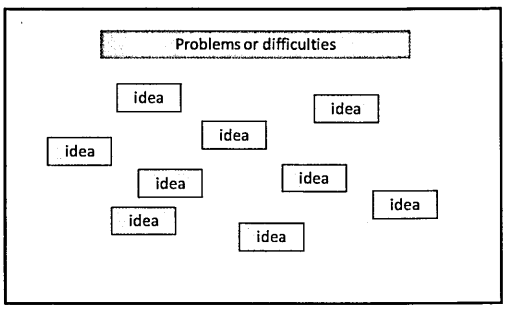
Appendix 9 Deepening step data collection instrument: focus group protocol, Native Potatoes Local Platform and Peach Local Platform

Session 1: Welcome, explanation of objectives and procedures, gathering participants' expectations.

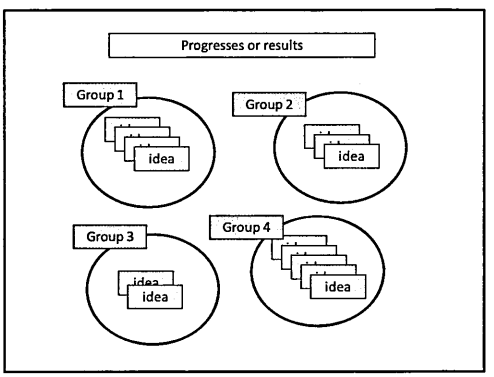
Session 2: brainstorm

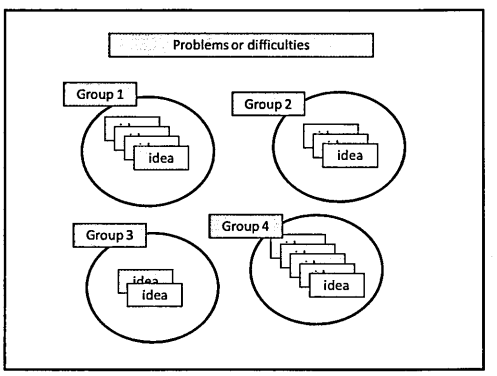
- Guiding questions:
  - What are the progresses or results of the platform?
  - What are the problems or difficulties that the platform confronts?
- Gathering ideas: The facilitator writes ideas from the participants in cards. The facilitator stimulates all the participants to offer their ideas. Cards are posted in a wall.





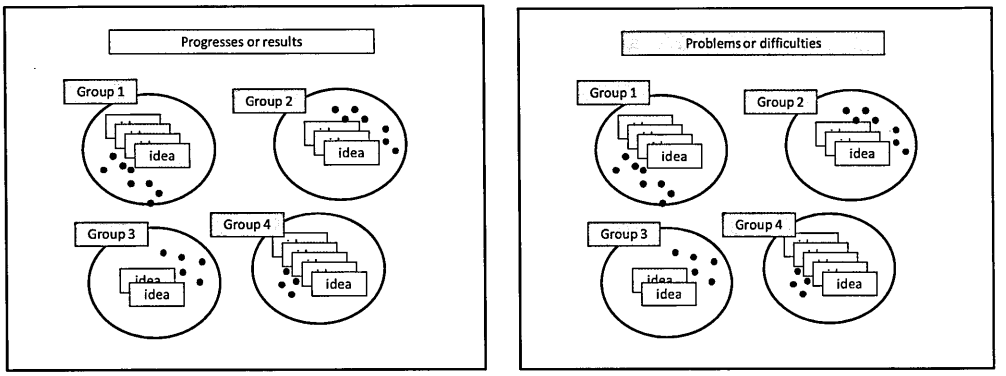
- Grouping ideas: The facilitator helps the participants to group common ideas





Session 3: Voting exercise

- Using stickers participant votes for the groups they considered the most important
- Possible number of votes per participant = number of groups
- Participants can vote for one alternative more than once



Session 4: Open discussion

- After voting the participants are asked to comment on the results
- The facilitator stimulates all the participants to offer their comments
- The facilitator takes notes. All comments are recorded

List of participants

Native Potatoes Local Platform

The focus group session was held with three representatives of farmers, one of the local government and two of R&D organizations.

Peach Local Platform

The focus group session was held with three representatives of farmers, three of the local governments, and two of R&D organizations.

Appendix 10 Consent letter (example)

Declaración de acuerdo
Agreement declaration

Proyecto de Investigación: Redes complejas para la innovación agrícola en respuesta a las necesidades de los agricultores y a oportunidades de mercado
(Research Project: Complex Networks for Agricultural Innovation in Response to Market Opportunities and Poor Farmers' Needs)

Yo *(I)*, ... Lily Luna .....

Declaro que:
(Declare that:)

Estoy de acuerdo en participar brindando información en este proyecto de investigación.
(I agree to take part in this research project providing information)

He recibido una explicación sobre los propósitos de la investigación y sobre los instrumentos de recopilación de información que serán utilizados (cuestionarios, entrevistas y talleres)
(I have received an explanation on the purposes of the research project and on the instruments to gather information that will be used (questionnaires, interviews, and workshops)

Sé que puede declinar mi participación con tan solo pedirlo.
(I know that I can refuse to participate at any point by simply saying so)

Sé que puedo solicitar que la información que proporciono no sea considerada con solo pedirlo.
(I know that I can request that the information that I provide to be not considered simply saying so)

Se me ha asegurado que la confidencialidad de la información que proveo está asegurada
(I have been assured that my confidentiality will be protected)

Estoy de acuerdo en que la información que proveo sea utilizada con propósitos académicos o de investigación.
(I agree that the information that I provide can be used for educational or research purposes)

Entiendo que si tengo alguna duda, problema o preocupación relacionada con la investigación puedo contactarme con el investigador Claudio Velasco a la siguiente dirección:
c.velasco@cgiar.org
(I understand that if I have any concems or difficulties I can contact the researcher Claudio Velasco at the following address: c.velasco@cgiar.org)

Firma:
(Signature):